

MINISTRY OF SCIENCE AND EDUCATION OF RUSSIAN FEDERATION
NATIONAL RESEARCH TOMSK POLYTECHNIC UNIVERSITY

**STRATEGIC PROGRAMME ON NATIONAL RESEARCH
TOMSK POLYTECHNIC UNIVERSITY COMPETITIVENESS
ENHANCEMENT IN THE GROUP OF TOP LEVEL WORLD
RESEARCH AND ACADEMIC INSTITUTIONS**

2013

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INTRODUCTION

Tomsk Polytechnic University (TPU) was founded in 1896 as Tomsk Technological Institute of the Emperor Nicolas II and is historically recognized as the first technical higher educational institution in the Asian part of Russia. The university has trained over 150 000 specialists including the designer and constructor of the Ostankino Television Tower Nikolay Nikitin, one of the founders of the national helicopter industry Nikolay Kamov, the first president of Kazakhstan Academy of Sciences Kanysh Satpaev. In 1997 the Russian Federation Presidential Decree enlisted TPU into the State Code of Particularly Valuable Objects of Cultural Heritage of the Peoples of the Russian Federation. In 2009 TPU got the statute of “National Research University”.

TPU runs specialists’ training in the framework of a multilevel system on a wide range of educational programmes with the view of Russian key economic sector development. TPU’s educational programmes are designed with due consideration of the requirements of national and international non-profit professional organizations such as Association for Engineering Education of Russia, Washington Accord, ENQHEEI, ENAEE, and with regard to the criteria for international certification of professional engineers FEANI, WFEO, APEC Engineers Register and EMF [1].

TPU is in contractual relationships with more than 400 partners including the Russian Academy of Sciences, leading national and foreign universities, the Chamber of Commerce and Industry of the Russian Federation, OJSC “Gazprom”, The State Atomic Energy Corporation “Rosatom”, OJSC “Rosneft”, OJSC “Gazprom Neft”, “Roscosmos”, OJSC “Alrosa”, OJSC “Transneft”, OJSC “SIBUR Holding”, OJSC “Federal Grid Company of United Energy System”, JSC “System Operator of United Energy System”, “Lapp Group”, “Woodward”, Siemens PLM, CJSC “R-Pharm”, Intersector Production Association of Employers of Tomsk Region and other.

TPU is a member of the Conference of European Schools for Advanced Engineering Education and Research (CESAER), Consortium of Leading Universities of Science and Technology for Education and Research (CLUSTER), The T.I.M.E. Association of Technical Universities, and a member of the international project CDIO Initiative aimed at engineering education modernization.

“Only the teacher, who is strong in science, possesses science and loves science will affect productively on the whole body of apprentices”.

Dmitry Mendeleev, outstanding Russian scientist and public person, TPU Honorary Member since 1904.

SECTION 1. THE STRATEGIC GOALS AND INDICATORS.

PROSPECTIVE MODEL OF THE UNIVERSITY

1. FORMULATION OF THE UNIVERSITY STRATEGIC GOAL

The goals model and development strategy of the university are predetermined by the analysis of the worldwide trends in the research and educational field and global challenges the humanity is facing.

The University Strategic Goal

The strategic goal of the Tomsk Polytechnic University is to become one of the world-leading research universities in the area of resource-efficient technologies solving global societal, economic and environmental problems for the benefit of the mankind sustainable development.

System of Goals

- World-class science and research;
- Globally competitive engineering education;
- Dissemination of best academic and engineering practices;
- Close collaboration with industry and other stakeholders towards innovation;
- Training and engagement of the distinguished students, scientists and teachers;

- Transition into the university focusing on graduate and postgraduate education;
- Efficient resource management;
- Social accountability and responsibility.

The list of obligatory and supplementary performance indicators and their values along with calculation methods of the additional indicators are given in Appendix 1 of Form 6.

2. THE UNIVERSITY GOALS MODEL

2.1. The University Mission

The Mission of National Research Tomsk Polytechnic University is to enhance competitiveness of the country by providing internationalization and integration of research, education and training applied in the process of educating engineering elite, generating new knowledge and innovative ideas, developing resource efficient technologies (adopted by the University Academic Board on 05.04.2011).

The University values are as follows:

- Freedom and enthusiasm on broadening knowledge in priority fields of science for the benefit of the mankind and wellbeing following professional ethics;
- Innovations in science and education in striving for excellence and expertise in profession;
- Independent thinking and creativity in addressing challenges faced by the university, the country and the whole world;
- Social responsibility for the results of our activity;
- Staff involvement into all fields of the university activities that allows the teachers, other employees and students, both present and future ones, to fulfill their full potential;
- Unity of the alumni, students and employees, based on century-long traditions established throughout our history;

- Corporate culture that provides open atmosphere and comfortable university environment;
- Freedom of personality that is manifested in elimination of any racial, ethnic, religious, gender, political or other form of discrimination.

2.2. The Reference Group of the World Leading Universities

The reasons for choosing the reference group of the world leading universities as models for the development of Tomsk Polytechnic University are as follows:

- successful academic activity in different geographic, cultural and language environments;
- focus on technical specialization;
- active positioning in various segments of international ranking tops.

Table 1. TPU Reference Group of Universities

Full name of the university	Short name of the university	Rankings position, 2012		
		QS	THE	ARWU
Nanyang Technological University (Singapore)	NTU	47	86	201–300
Royal Institute of Technology (Sweden)	KTH	142	140	201–300
Arizona State University (the USA)	ASU	330	148	79

Other distinctive features of the universities:

- **NTU** has shown consistent growth over the recent years in the top lines of all major international academic rankings, dynamically progressing in the zone of the most intense competition [3];
- **KTH** is the biggest technical university in Scandinavia which has focused its efforts on resource-efficiency issues [4];
- **ASU** is the largest non-metropolitan research university in the USA which has rapidly reached outstanding achievements despite the specific climatic conditions of Arizona [5].

The reference universities' major competitive advantages are:

NTU's major strength is a high degree of internationalization [6]. The university employs about 3,600 research and teaching staff members from 66 countries and trains undergraduate and postgraduate students from 83 countries which is the largest proportion of foreign students and postgraduate students in all Asian universities. Over 156,000 of NTU alumni work in 121 countries all over the world.

KTH's distinctive feature is its steady and strong cooperation with industrial partners including such companies as Ericsson, Volvo, IBM, Tele2, TietoEnator, Microsoft and Intel. There are five interdisciplinary research platforms where KTH acts as the main strategic partner [7]. The volume of Research and Development activities (R&D) at KTH makes up 68% of the university total budget [8].

ASU's high level of research is greatly conditioned by the large number of graduate and postgraduate students (13,850 people) [9].

2.3. Marketing Strategy

2.3.1. Research Market: Major Areas and Scientific Fields

TPU's research work is organized into six Clusters according to interdisciplinary fields that enable provision of breakthrough results in solving the global mankind issues. The choice of the development field was determined by:

- major challenges faced by the mankind [10, 11];
- the strategy of key markets development [12, 13, 14];
- the priority development fields of science, technology and engineering in the Russian Federation [15];
- TPU priority development fields [16].

The programme envisages TPU development as a network Center of Excellence in the field of resource-efficient technologies (Figure 1) that unites 6 research and educational clusters: 4 basic and 2 supplementary ones.

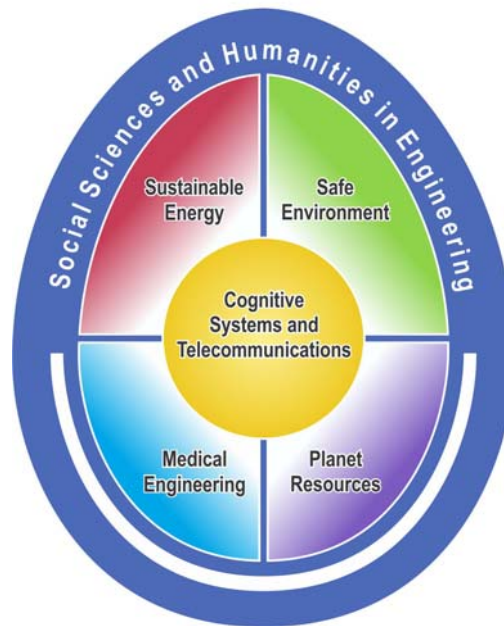


Figure 1. Network Center of Excellence «Resource-Efficient Technologies»

The Clusters are organized according to the network principle and bring together different TPU research and educational structures and strategic partners, working in the following areas.

Cluster “Safe Environment”:

- Non-destructive testing and diagnostics;
- Materials for extreme conditions;
- Domestic and industrial waste recycling.

Cluster “Sustainable Energy”:

- High-temperature superconductivity technologies for energy production;
- Nuclear and hydrogen fuel of the new generation;
- Hybrid simulation in energy production;
- Resource-efficient generation.

Cluster “Medical Engineering”:

- Bioengineering materials and technologies;
- Radiation technologies in bioengineering;
- Electrophysical biomedical complexes.

Cluster “The Planet Resources”:

- Resource-efficient use of mineral resources;
- Clear water;
- Green chemistry.

Cluster “Cognitive Systems and Telecommunications”:

- Cognitive software and hardware systems;
- Wireless telecommunication systems and technologies.

Cluster “Social Science and Humanities in Engineering”:

- Social science and humanities component of engineering;
- Mechanisms of technical innovations initiation and engineering forethought.

Major industries that research and development works are carried out for: fuel and energy complex, chemical and oil-refining industry, rocket and space industry, mechanic engineering, instrument engineering, electronics, defense industry, geology and mining, environment protection, information technology and telecommunications, medicine and pharmaceutical industry, transport, construction, housing and utilities sector, and other.

2.3.2. The Market of University Applicants – Geography, Qualitative Composition and Methods for Talents Engaging

Applicants’ market choice of TPU is affected by geographical position of Tomsk; demographic trends in Russia and in the world; structural changes in the economies of those countries which are usual providers of TPU applicants; and TPU goal to become a university of graduate and postgraduate education. The University is planning to attract up to 75% of university applicants from graduates of Russian schools with an average Unified State Examination score at least 85: 15% – from CIS countries; and 10% – from other foreign countries, mainly from Asia Pacific Region where the demand in academic services is unsatisfied, and from European universities that are TPU partners within “double degree” programmes realisation.

Principal Methods for Talents Engagement:

- new academic programmes development in collaboration with leading foreign universities (including “double degree” programmes) that ensure high value to alumni on the job market;
- TPU positioning as a university with unique educational programmes in accordance with international standards;
- ensuring highly competitive enrollment for the programmes of all levels of education;
- geographic expansion of outreach activities in the regions of Russia and abroad with the active involvement of TPU Alumni Association branches;
- development of TPU Internet-Lyceum based on the gamification technologies;
- grants to support best Russian and international students;
- TPU campus development.

2.3.3. Types of Employers’ Companies and Organizations that TPU is Focused on

The achievement of Russian economy global competitiveness is associated with the intensive change in the structure of production and employment in favor of high-tech sectors as well as with provision the economy sector with highly qualified personnel (the task to create 25 million of high performance jobs by the year 2020 [17]).

TPU is focused on the following companies and organizations which are the employers of the University alumni and potential customers for research services:

- transnational companies and corporations working in the University priority development fields;
- industrial companies of high-tech sectors of economy;
- innovative small and medium-scale enterprises (SMEs), including participants of regional innovation clusters and technological platforms;

- organizations of innovative infrastructure: engineering companies, joint use centers, prototyping centers, industrial parks, technology development special economic zone.
- Russian and international research and educational organizations;
- state authorities and local autonomous bodies.

2.4. University IT Infrastructure. Fields of Informatization

The development of information technologies (IT) at TPU is aimed at implementing of the world best practices in education, scientific research activities, and resource management. With this regard, the main tasks are as follows:

- e-learning environment development on the principles of Smart-education, development of free-access bank of academic resources integrated with the information systems of TPU partners based on cloud technologies;
- scientific and professional communities information support by the means of network interaction environment development;
- Enterprise Resource Planning (ERP system) launching for complex trends foresight and planning: admissions campaign, demand for the study fields, academic performance improvement, optimization of monetary investments in commercial activities, anticipatory planning of research support, etc.

2.5. University Human Resource Potential Including Top Management, Research and Teaching Personnel

As a leading research and academic institution TPU aims to become an attractive workplace for energetic and initiative people by means of the formation of an intellectually rich environment, sufficient material and technical resources, competitive salary level and wage supplements. The University will provide the balance between teaching and science, hiring personnel capable of generating new ideas, mastering advanced technologies, demonstrating high performance in research thus promoting staff and students' comprehensive development.

Requirements for research and teaching personnel and management at TPU are:

- Academic degree (rank) including PhD degree obtained in leading Russian and foreign universities or research organizations;
- Work experience and regular professional training in leading research and education centers and high-tech companies;
- Foreign language proficiency that allows fluent communication with international colleagues for implementation of scientific and academic projects, articles publication in international periodicals and teaching international students.

Applicants for executive positions are to have experience of large-scale projects successful implementation and be selected on competitive basis.

Flexible personnel policy aimed at achieving TPU strategic goals will promote the corporate environment formation where the contribution of each employee, regardless of gender, religious or philosophical beliefs, ethnicity, personal characteristics and selected career path are valued and rewarded.

2.6. Prospective Characteristics of University Facilities and Infrastructure

University research facilities and infrastructure includes a network of joint use centers and represents a unique complex of modern equipment and large setups including unique research nuclear reactor (IRT-T) – the only one located to the East of the Urals that enables conducting wide range of research activities in the priority development fields of resource-efficient technologies.

The Advanced Development Plan of the University includes the establishing of Laboratory and Research Science Park for Resource-Efficient Technologies, representing a unified Joint Use Center for all Academic Clusters. The University Laboratory Complex is to be additionally provided with unique equipment for conducting research in the following fields:

- development of deep processing of hydrocarbon raw materials and solid natural resources;
- applied research in the field of water treatment and purification on the basis of de-ionization, beam-plasma and radiation disinfection technologies;
- development of technologies for purification, disinfection and recycling of industrial waste;
- digital radiography on the basis of betatrons, antibetatrons and other radiation sources;
- development of high-molecular composite materials used in extreme conditions;
- problem solving in the field of high-temperature superconductivity;
- nuclear physics methods for polymer fuel cells membranes;
- development of new types of radiopharmaceuticals;
- development of new fields of biomedical research, etc.

Advanced facilities and infrastructure of the University will enable conducting cutting-edge research of national and international significance that will change the world and go beyond traditional boundaries of academic disciplines.

2.7. Economic and Financial Models

The strategic goal of University economic and financial management is to secure long-term financial stability and maintenance of the level of investments necessary to achieve significant results in research and academic fields.

Such resource-efficient management principles as elimination of duplication in programmes and projects, reallocation of resources in favor of promising and effective projects, reduction of costs for administrative and supporting activities constitute the basis of TPU financial model. Realization of this model will ensure high dynamic growth of consolidated budget revenues.

Table 2. Dynamics of TPU Consolidated Budget

Year	2013	2014	2015	2016	2017	2018	2019	2020
Consolidated budget, bln rubles	6.1	6.8	7.6	9.3	10.3	12.3	13.0	15.0
Including the amount of external funds, bln rubles	2.9	3.8	4.4	5.7	6.5	8.1	8.6	9.9

The development strategy fields of the financial model:

- increase in percentage of revenue from the results of research activities, charitable contributions and donations;
- continuous monitoring of effective expenditures getting from the Federal Budget and the revenues from income-generating activities, safety and rational use of tangible and intangible assets;
- increase the percentage of development projects funding up to 50%.

The structure of income at the University will change significantly. The major percentage will include the funds raised from the research activities in three main areas: programmes, projects and grants; industrial and other partner organizations' contracts; and charitable contributions for research.

The University will develop a system for the attraction of charitable contributions, primarily into the TPU's Endowment-Fund.

In such conditions, the key to success is the strategic management of the University's activities. This management integrates planning, budgeting, and continuous improvement of education and research quality.

2.8. Other Characteristics of the University Target Model that Unveil its Peculiarities and Competitive Advantages at International Level

2.8.1. TPU Positioning as an International Platform on Formation and Development of Resource-Efficiency Ideas

The TPU Image Forming Strategy implies the use of publicity capital of such a significant global issue as resource-efficiency. Choosing this scope, we took into account its current actuality both on the global scale and for each person in particular, as well as the University significant progress and potential in the field of resource-efficient technologies.

The chosen TPU Positioning Strategy implies accomplishing of two major tasks. The first one is to reinforce TPU reputation by forming a professional and academic expert community focused on the problem of resource-efficiency. The second one is to form an Open International Information Sites devoted to resource-efficiency issues and enabling us to involve the best scientists, experts, and journalists in content writing (Internet hub, research magazine, e-digest).

2.8.2. Internationally Oriented University Infrastructure

The main results of TPU property complex development in increasing the University global competitiveness will be as follows:

- construction of two modern hostels for accommodation of 1,500 students;
- modernization of at least 50% of the current property complex;
- Putting into operation the Science Park with flexible infrastructure for conducting networking interdisciplinary research projects in the field of resource-efficiency;
- construction of Business Incubator with Congress Center to implement international research projects and arrange large-scale academic and scientific events;
- increase the resource-efficiency of existing facilities;
- construction of new sports and social infrastructure facilities and modernization of existing ones.

2.8.3. Strategic Partnership and Networking Cooperation

TPU is aiming to become a cooperation centre for a wide range of academic organizations and business structures through developing of horizontal and vertical ties and collaboration spheres. The University is intended to meet the priority requirements of enterprises and organizations thus maximizing the mutual benefit derived from joint ventures.

An effective system of strategic and networking cooperation with partners and agents will allow:

- to create and improve the current educational programmes and standards to meet the global challenges and trends;
- to boost research and development;
- to develop the life-long professional learning system;
- to provide the learning process with sites for practice and internship for making students, postdocs, research and teaching staff as adaptable to partner needs as possible;
- to maintain TPU's reputation as a reliable partner in the field of education, science and innovations.

3. ANALYSIS OF KEY GAPS BETWEEN CURRENT AND TARGETED INDICATORS' VALUES AND THE UNIVERSITY CHARACTERISTICS

The gap between the current (as of end 2012) and targeted (2020) positions of the University in the world leading rankings is associated with a group of performance indicators, in which TPU is behind the leading universities so far. The most significant gaps are as follows:

- Number of articles indexed in Web of Science and Scopus per one research and teaching staff member (2012 – 0,5 articles / 2020 – 4,7 articles).
- Mean citation index per one research and teaching staff member calculated from the aggregate of articles registered in Web of Science and Scopus (2012 – 2,4 / 2020 – 11,1).

- Percentage of foreign professors, teachers and researchers among University research and teaching staff members, including PhD holders from international universities (2012 – 0,1 % / 2020 – 10 %).
- The average Unified State Exam score of the University students receiving full-time tuition funded from Federal Budget in Bachelor Degree programmes and Specialist Training Programmes (2012 – 67,87 points / 2020 – 85 points).
- Percentage of the programmes delivered in English (2012 – 6 % / 2020 – 30 %).

Main reasons for the existing gaps:

- Insufficient level of English language proficiency among students and staff;
- Low level of internalization;
- Concentration of “big” science at state academies;
- Significant percentage of successful regional school graduates striving for enrolment to metropolitan cities universities;
- Few educational programmes in the medium of English;
- Insufficiently modern campus infrastructure;
- “Technological stagnation” of the 90s in Russia accompanied by low demand in the engineering profession;
- Barriers to foreign scientists’ employment by Russian universities.

The main gaps are supposed to be eliminated by means of implementing the set of strategic initiatives listed below.

STRATEGIC INITIATIVES

3.1. Forming a Portfolio of the University’s Programmes and Intellectual Products Providing International Competitive Performance

Initial state:

TPU has its own standard of bachelor, master degree and specialist educational programmes designed in compliance with international standards of engineering education. Over 40 of the main TPU educational programmes (23% of their total quantity) have been accredited by reputable international organizations:

Accreditation Board for Engineering and Technology (ABET), Canadian Engineering Accreditation Board (CEAB) and Association for Engineering Education of Russia (AEER) with the EUR-ACE Label of quality assigned. There are 13 master degree programmes for double degree (12% of the total quantity) with foreign universities.

TPU staff receives over 120 patents annually. The University holds the second place among Russian universities in the number of patents supported.

Desired state:

The portfolio of educational programmes and intellectual products in line with global standards and practices will form the basis of the University's competitive performance:

- Percentage of programmes of all levels, accredited according to international criteria – at least 50%.
- Percentage of joint double-degree (DD) educational programmes with leading foreign universities – at least 30 %.
- Percentage of international patents – at least 30%.
- Percentage of license agreements based on the results of TPU staff's intellectual activities – at least 30%.

Fields of work:

Key mechanisms for developing the educational programmes package:

- modernisation and development the educational programmes including custom tailored specialist training programmes for corporate customers, DD programmes in cooperation with leading Russian and foreign universities, and state academies of sciences;
- transition to the module-based inter-disciplinary approach to educational programme design and implementation;

- development of a virtual learning environment with the active use of global open learning resources (*EdX, Coursera*);
- development of educational modules for resource-efficiency, engineering leadership, innovation and business administration.

Key mechanisms for developing an intellectual product package:

- development of networking academic clusters to support research at the interdisciplinary level;
- development of knowledge and technology transfer system in order to encourage obtaining the results of intellectual activity as well as filing patents and license agreements for them;
- enhancement of cooperation with partners for promoting research results and developing high-technology products.

3.2. Engagement and Training the University Key Personnel, Advancement in Quality of Research and Teaching Staff

Initial state:

TPU full time research and teaching staff is 1809 people: 22 of them are active and corresponding members of state academies of sciences, 337 – DScs and 1278 – PhDs. We engage high-quality specialists from the real economy sector, leading staff from Russian and foreign research and educational organizations.

Overall, the University key personnel possesses a sufficient set of modern academic competences: over the last five years, we have doubled such important University development indicators as publication activity, funds raised by research, number of PhD theses defended, number of international students. However, there is a number of systemic issues preventing the University from further increase of its global competitive performance: not enough staff with high English language proficiency, poor integration of the academic staff in the international academic community, “aging” of academic and research staff.

Desired state:

TPU Human Resources Development Programme will help to involve academic specialists able to organize educational and research activity in accordance with the best world standards. The key attributes reflecting the high quality of the key personnel are adopted as follows:

- mean age of research and teaching staff – under 45 years old;
- percentage of international professors and researchers in the total number of academic staff, including Russian citizens – PhD holders from international universities – at least 10%;
- advanced training of the academic staff in the leading high-technology companies, scientific organizations and universities – no less than 2 times per each 3 years;
- percentage of research and teaching staff with publications indexed in the Web of Science and Scopus databases – at least 75%;
- percentage of academic staff with the *h-index* of over 10 – at least 5%;
- foreign language fluency;
- the ratio of the mean salary of the research and teaching staff to the mean salary in the region – 3 to 1.

Fields of work:

Key mechanisms for involvement outstanding scientists and teachers from leading international and Russian universities and research organizations:

- development of the system for search and attracting highly qualified specialists from the international labour market;
- increase the level of English language proficiency among the University staff and students;
- increase the number of educational programmes delivered in the medium of English and international accreditation of educational programmes;

- implementation of the module-based approach to learning process organization;
- invitation of scientist groups from different universities and research organizations for joint implementation of networking research projects;
- introduction of a bi-lingual communication environment at the University;
- provision of comfortable living conditions for the visiting staff and their families.

Key approaches to training the academic staff of the world level:

- transformation of TPU into a university with prevailing number of graduate and postgraduate programs;
- improvement of the Elite Engineering Education system [18];
- organization of full-time postgraduate education and postdoc institute;
- implementation of long-term retraining and advanced training programmes for the research and teaching staff in leading Russian and foreign universities, research organizations and enterprises;
- development of scientific schools and research infrastructure;
- development of the practice of PhD thesis defence at leading international universities;
- setting the salary level to provide decent standard of living for staff and their family members;
- formation of executive personnel Staff Reserve;
- development of the creative and intellectually rich environment at the University;
- improvement of the University's social infrastructure.

Transition to an effective fixed-term contract with each staff member will be a brand new tool integrating all the above mentioned mechanisms of qualitative development of the University key personnel.

3.3. Attracting Talented Undergraduate, Graduate and Postgraduate Students

Initial state:

Currently, the average Unified State Exam score of the TPU students receiving full-time tuition funded from Federal Budget in Bachelor Degree programmes and Specialist Training Programmes is 67.87 points. About 14% of students are enrolled in TPU due to their academic competition – “Olympiads” results. There is a system of Elite Engineering Education (EEE) with 4% of students being taught within it. There are 1756 master degree students (16%) and 588 postgraduates (5%).

Desired state:

TPU aims at attracting the students who are intelligent, socially active and willing to develop their skills and abilities in the research and engineering activities. The University expects to reach the following indicators:

- Average Unified State Exam score of the students receiving full-time tuition funded from Federal Budget in Bachelor Degree programmes and Specialist Training Programmes – 85.
- Percentage of talented students selected for enrolment according to the results of their studies at the TPU Internet Lyceum – at least 50%.
- Percentage of Elite Engineering Education students – 15%.
- Percentage of graduate and postgraduate students in the total number of full-time student population – at least 55%.
- Percentage of postgraduates with research articles indexed in the Scopus or Web of Science database – 100 %.

Fields of work:

Key mechanisms for attracting talented students:

- Development of a virtual learning site based on the gamification technologies (Internet-Lyceum) to work with secondary school students;
- Implementation of complex system for interaction with pre-university education institutions (seminars and conferences for teachers and secondary school children, extension of profession oriented class network, grant support for teachers);
- Broadening geography of enrolment, also with the assistance of the TPU Alumni Association;
- Development of the Elite Engineering Education system integrating the international experience;
- Organization of effective TPU brand promotion in Russia and abroad.

Key mechanisms for attracting talented graduate and postgraduate students:

- Development of grants and individual academic scholarships system;
- Development of a system for competitive selection of graduate and postgraduate students for on-going research projects;
- Development of specialized educational programmes for graduate and postgraduate students;
- Development of a system for co-supervising of graduate and postgraduate students by leading scientists within international projects and laboratories;
- Provision comfortable environment for work and living;
- Development of a competitive system of research grants for international teams of young researchers;
- Organization of long-term internships in leading foreign universities and research centres for TPU graduate and postgraduate students within joint projects.

3.4. Mechanisms to Ensure Resource Concentration in Breakthrough Fields. Rejection of Non-Effective Fields of Activities

Initial state:

A well-balanced financial management system has been developed at TPU, which enables to realise effective budgeting of TPU Integrated Programme of Strategic Development key projects. Heads of structural units defend in public financial plans of the on-going activities and development projects of TPU Integrated Programme of Strategic Development. There is a system of internal financial and economic analysis and control. The financial system has been integrated with the unified IT environment of the University.

The consolidated budget of TPU was increased for the last five years from 3.2 billion roubles in 2007 up to 5.6 billion roubles in 2012 (2.6 billion roubles of them come from non-Federal-Budgetary sources).

Desired state:

The University will increase the income from educational, research and other activities as well as systematically improve the efficiency of budget and off-budget expenditures. The key indicators of the University's financial stability are:

- Percentage of development projects financing – up to 50% of the consolidated budget.
- Percentage of income from research and innovation activities, implementation of federal target programmes – up to 58% of the consolidated budget.
- Consolidated budget in 2020 – 15 billion rubles.
- Suspension of non-effective activities and outsourcing of non-core activities.

Key mechanisms:

- Growth of income by means of increased number of fundamental and applied R&D projects carried out in collaboration with Russian and international hi-tech organizations.
- Enhancement of productivity of joint resource application by developing common use centres and organization of networking cooperation with third-party organizations within academic clusters and other joint entities;
- Growth of income by exercising the rights for intellectual property, commercialization of research results and targeted investments, charitable contributions and donations (endowment);
- Prioritization of expenditures for educational and R&D activities;
- Transition to the international financial accounting standards.
- Development and implementation of the IT environment and technologies for real-time exchange and processing of financial and economic information.
- Provision of balance between expenses for estate maintaining and construction of new facilities.
- Solving energy efficiency tasks.

3.5. Development of a University Management System to Provide the Achievement of the Target Model Performance Indicators

Initial state:

Nowadays the governing collegial board of the University is the TPU Assembly. The membership of the Assembly ensures a wide representation of staff and students, alumni, representatives of science, business and authority: it includes members of the University Academic Council, Board of Trustees, the Board of the Alumni Association, the Students' Council.

The University's organizational structure is formed in compliance with TPU Strategic Plan for Development as National Research University. In 2010 Research

and Educational Institutes were formed as a result of merging faculties and research institutes. This made it possible to integrate educational and research activities, to form the basis for interdisciplinary research, to increase the number and scale of R&D, to get students and professors more actively involved in research and attract researchers to teaching.

Desired state:

TPU will continue to improve its organisational structure and institutional bases of networking collaboration, so that artificial borders between structural units could not impede the ability to respond to changes in the world or slow down interdisciplinary projects. For this purpose the University will:

- change the legal statute and organizational structure to independent non-profit organization;
- transfer to international financial management and financial accounting standards;
- organise research and educational projects realisation on the networking basis;
- work for increase of the percentage of university management staff that received training and/or have experience of managerial work at the leading Russian and foreign academic centres for up to 100%;
- develop electronic system of business processes management.

Key mechanisms:

- development of interdisciplinary entities and fixed term research groups, form a pool of international experts;
- creating project offices of networking clusters;
- shared use of classrooms, laboratories and facilities of different structural units as well as those of strategic partners including institutes of Russian Academy of Sciences;

- joining the efforts with the leading strategic partners to address the issues of global importance;
- forming TPU corporate culture to foster the achievement of strategic goals of University development;
- implementation of electronic system of business processes management including a students` pool management system.

3.6. Other fields

3.6.1. Transformation of TPU into a University of Graduate and Postgraduate Education

Initial state:

Nowadays TPU is a traditional Russian university mainly focused on bachelor and specialist training. Their percentage in the total University student population makes up to about 84 %.

Desired state:

The distinctive feature of a modern research university is prevailing of graduate and postgraduate educational programmes over bachelor degree and specialist training programmes, which allows the institution to focus its resources on research. TPU intends to enhance graduate and postgraduate educational programmes by using and developing its current facilities and infrastructure, qualified research and teaching staff, close collaboration with the leading academic centres, industrial enterprises and attracting the best bachelor's degree holders from Russian and foreign higher education institutions:

- Percentage of graduate and postgraduate students from the total number of full-time student population – at least 55 %;
- Introduction of the system of a compulsory term of studying abroad on graduate programmes at partner universities;

- Pre-sessional training programmes delivered in the medium of English;
- Percentage of graduate and postgraduate students' research publications in the total number of scientific articles indexed in the Scopus and Web of Science databases will reach 30 % a year;
- The majority of resources will be concentrated on graduate and postgraduate training programmes.

Key mechanisms:

- Development of relevant and on-demand graduate and postgraduate programmes;
- Attracting young talents to graduate and postgraduate programs;
- Reducing the number of students enrolled for extramural study programmes;
- Rejection of not actual bachelor degree programmes.

3.6.2. Transition to Module-Based Approach for Learning Process

Organization

Initial state:

There are two educational programmes that are currently based on the module-based principle run in TPU. The portfolio of international educational programmes run on the module-based principle has been formed at TPU. There is an effective tutoring (mentoring) system developed at TPU, an information system generating individual learning pathways for students as well as a system of learning achievements assessment. The University has introduced a personalized learning environment.

Desired state:

Implementing a module-based technology will allow increase teaching efficacy and optimise research and teaching staff working time, free up the time for research and professional training and attract leading Russian and international professors and researchers to deliver modules at TPU.

By 2020 the percentage of educational module-based programmes must reach 100%.

Key mechanisms:

- Restructuration the courses to fit with the module-based learning process organization approach.
- Introduction information and software system for module-based learning process management.
- Provision of sufficient well-equipped educational, research and social space.

3.6.3. Forming Bilingual Research, Educational and Social Environment in the University

Initial state:

TPU has been training international students for 15 years as it obtained the right to develop and deliver the programmes in the medium of English in 1999. [19]. Today the international environment of the University is represented by more than 1611 foreign students from 30 countries. There are 4 bachelors' and 12 masters' programmes delivered in the medium of English, including 7 double degree programmes as well as 200 courses for academic mobility programmes. There are profession oriented foreign language departments at all research and educational institutes of the University. About 100 foreign specialists take part in research and educational activities of TPU annually.

Desired state:

With the aim of maximum integration into modern international research and educational community the linguistic academic and social environment of the University will include two equal components: Russian language and English language – the language of world's science.

- The percentage of educational programmes delivered in English – 30%;
- Number of double degree programmes – 30;
- Percentage of international research and teaching staff including Russian citizens – PhD holders from international universities – 10%;

- Percentage of international students enrolled in mail educational programmes (including the students from Commonwealth of Independent States (CIS) countries – 25 %;
- Percentage of research and teaching staff with English language proficiency – 100 %;
- Bilingual social environment.

Key mechanisms:

- Introduction of the provision about the level of English language proficiency into qualification requirements and effective contracts of staff members;
- Implementation of the life-long English language learning system for TPU staff members including the involvement of native speakers to teaching process;
- Organization of abroad internships and advanced professional training system;
- Active participation of foreign specialists in the University research and educational activities;
- Delivery of educational programmes and modules in English.

4. CHANGE MANAGEMENT

TPU has sufficient experience in structural transformations with the purpose of addressing the goals facing the University. TPU has the established system of short- and long-term planning, management and monitoring of strategic initiatives implementation. There is an effective feedback between structural units and personnel.

Development of “*Strategic Programme on National Research Tomsk Polytechnic University Competitiveness Enhancement in the Group of Top Level World Research and Academic Institutions*” is based on the comprehensive discussion of its goals and objectives, mechanisms for achievement results by the all University personnel – university management, staff and students. The personnel is a solidary

team of like-minded people who strive for developing and increasing the University potential.

The implementation of “*Strategic Programme on National Research Tomsk Polytechnic University Competitiveness Enhancement in the Group of Top Level World Research and Academic Institutions*” will involve the following mechanisms in change management:

- Forming the vision of TPU as the world leading Research University. Creating the Programme “roadmap”;
- Developing a system of information analysis support for the Programme implementation. Notifying each University staff member of the initiatives to be implemented and their efficiency.
- Step-by-step changes in the University structure and management system aimed at eliminating obstacles impeding the institutional transformations that are to be in compliance with the strategic goals and objectives of the Programme.
- Concentration of resources in priority fields, initiatives and projects.
- Forming the corporate culture and supportive creative environment that would foster strategic goals realisation of the University development.

Developing the Programme, the University staff is basing on the experience accumulated from previous University strategic development programmes including TPU Strategic Plan for Development as National Research University. The achieved results as well as the analysis of challenges from the inner and outer environment allow formulating the objectives for further advancement of University’s competitive performance. These objectives have been extensively and openly discussed during the sessions of Academic Councils of TPU research and educational institutes, departments and labs staff meetings, sessions of the Board of Trustees and Students’ Council and at the session of the chief governing board of the University, TPU Assembly, as well as during the events involving the key stakeholders of the University.

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Chapter 2. PROGRAM STRATEGIC INITIATIVES

Strategic Initiative 1. Realisation of activities for strategic partnership and network cooperation

1.	Develop strategic partnership and network cooperation						Unit of measure position		
	Task 1	The University position (with accuracy of 50) in QS rankings (in general list)							
	Target						2020		
	2013	2014	2015	2016	2017	2018	2019		
	601+	551–600	401–450	301–350	251–300	201–250	151–200		
	Target	The University position (with accuracy of 50) in THE rankings (in general list)					Unit of measure position		
	–	–	–	–	351–400	351–400	301–350		
	Target	The University position (with accuracy of 50) in ARWU rankings (in general list)					Unit of measure position		
	–	–	–	–	–	–	–		
	Ways of task realisation:	<p>TPU role in global academic environment and reputation in international business community. Strategic network cooperation based knowledge and technologies transfer. Present University as an international platform of resource-efficiency. Disseminate best educational and engineering practices and success stories. To create institution of international experts and integrate them in research and education activities. Develop new forms for cooperation with international employers. Participate in high-status international events, associations and large-scale research projects. TPU staff work in famous and reputable periodicals' editorial boards. Majority of national and international mass media publish news and articles about TPU. New ways of raising awareness about TPU in national and international mass media.</p>					Cost estimating (total and out of subsidies)	Total 1,109 mln roubles	Financed from Federal Grant (subsidies) – 0 roubles

Year	Main results:			Cost estimating	Including subsidies
2013	Strategic partners and experts database. Website on resource efficiency. Centre of Excellence "Resource-Efficient Technologies" is led by a distinguished international researcher.			24 mln roubles	0 roubles
2014	International Forum on Resource-Efficiency. Main national and international mass media publish news and articles about TPU. TPU's educational programmes and research projects are realised with participation of international enterprises' representatives.			50 mln roubles	0 roubles
2015	Qualitative increase of TPU positions in reputation component of the international rankings. The universities and enterprises international association foundation for promotion of the concept of resource-efficiency.			50 mln roubles	0 roubles
2016–2020	Majority of national and international mass media publish news and articles about TPU. TPU website traffic – 5,000,000 a year.			985 mln roubles	0 roubles

Strategic Initiative 2. Support of graduate and postgraduate students, interns, young research and teaching staff members

1. Task 1	Support of research of graduate and postgraduate students and young researchers			Unit of measure amount			
Target	Number of articles in Web of Science and Scopus per academic staff member			2019	2020		
2013	2014	2015	2016	2017	2018	2019	2020
0,6	0,8	1,1	1,5	2,2	2,9	3,6	4,7
Ways of task realisation:		<p>Organisational, financial and social support of research, teaching and learning. Perfection of Elite Engineering Education system. Establish full-time postgraduate studies. Postdocs institute. Launch Program on young students and researchers participation in international conferences and events. Mobility programs for TPU graduate and postgraduate students and young researchers in leading international universities and research centres within the framework of joint projects. Fellowships and grants for groups of young researchers of TPU academic clusters. Provide social and medical insurance. Foster University sport, art and cultural infrastructure.</p>					
		Cost estimating (total and out of subsidies)			Total	Financed from Federal Grant (subsidies) 4142 mln roubles	
					5114 mln roubles		

Year	Main results:	Cost estimating	Including subsidies
2013	Full-time postgraduate studies. University stadium is modernised. Realisation of personalised scholarships and grants system. Fellowships and grants for groups of young researchers of TPU academic clusters are launched.	89 mln roubles	77 mln roubles
2014	Postdocs institute. New dormitories for students and young researchers are built.	398 mln roubles	248 mln roubles
2015	Each graduate of Elite Engineering Education programme, graduate and postgraduate student has his/her research articles published and indexed in Web of Science and Scopus. 1000 graduate and postgraduate students and young researchers participated in international mobility programs.	354 mln roubles	227 mln roubles
2016–2020	500 postdocs employed at the university. University dormitories are renovated.	4273 mln roubles	3590 mln roubles

Strategic Initiative 3. Realisation of fundamental and applied research projects on national and international research priorities

1.	Task 1	Realise international research projects in the field of resource efficient technologies under the leadership of distinguished Russian and international researchers on the basis of Centre of Excellence “Resource Efficient Technologies”						
	Target	Average citation index per academic staff member calculated per totality of articles registered in Web of Science and Scopus	Unit of measure amount					
	2013	2015	2016	2017	2018	2019	2020	
	2,4	3,6	4,6	5,7	7,0	8,9	11,1	
	Ways of task realisation:	<p>To support research activities in the field of resource-efficient technologies run within the framework of academic clusters of Centre of Excellence.</p> <p>To upgrade incentives system in order to increase number of high impact journals publications. To establish international laboratories under the leadership of distinguished international researchers. To realise the model “teaching researcher”. To develop effective fixed-term contract system. TPU scientific journals are presented in Web of Science and Scopus.</p>						<p><i>Financed from Federal Grant (subsidies)</i></p> <p>3097 mln roubles</p>
		Cost estimating (total and out of subsidies)					Total	
		5184 mln roubles						

		<p>To organise international scientific conferences and forums in TPU. Participation of distinguished national and international researchers in interdisciplinary projects as leaders.</p> <p>To establish joint network laboratories with educational institutes, leading national and international universities and research centres. To upgrade and modernise University material and technical resources, Science Park with facilities and equipment for open access to University students and academic staff members.</p> <p>Perfection of internationally recognised Internet hub.</p> <p>To disseminate science magazine and international digest dedicated to the resource efficiency issues</p>						
		Main results:						
Year				Cost estimating	Including subsidies			
2013	Centre of Excellence "Resource-efficient Technologies".			227 mln roubles	152 mln roubles			
2014	Material and technical resources, facilities for network projects are upgraded and modernised. Percentage of equipment aged up to 5 years is at least 70 %.			337 mln roubles	215 mln roubles			
2015	Percentage of teaching researchers is not less than 50% of academic staff number. The complex of teaching, training and laboratory premises "Business incubator" is built.			320 mln roubles	220 mln roubles			
2016–2020	Science Park of resource efficient technologies is built. 2 TPU journals are presented in Web of Science and Scopus. Percentage of academic staff with Hirsch index of more than 10–5 %.			4300 mln roubles	2510 mln roubles			
2.	Task 2	Realization of RTD projects with Russian and international hi-tech organizations						
	Target	The percentage of income from international programmes and grants in total amount of income-generating activities		Unit of measure percentage				
	2013	2014	2015	2016	2017	2018	2019	2020
	3,0	3,5	4,0	5,0	6,0	8,0	10,0	12,0
	Ways of task realisation:	<p>To create the system for beneficial application of knowledge and technologies.</p> <p>To run joint RTD projects for international hi-tech companies. To establish joint research and educational centres with leading industrial companies</p>						
						Cost estimating (total and out of subsidies)	Total	Financed from Federal Grant (subsidies)
							4757 mln roubles	3047 mln roubles

		within the framework of network TPU inter-cluster collaboration. Prototype design and production. To conceive innovative projects in TPU «proof of concept» center run by interdisciplinary teams for knowledge and technologies commercialisation. To form of the pool of accredited representatives on the markets of Europe, Asia and America for introduction of TPU developments to the global market. To promote TPU projects and developments to the global market.			
	Year	Main results:		Cost estimating	Including subsidies
	2013	Network interdisciplinary projects.		67 mln roubles	67 mln roubles
	2014	TPU «Proof of Concept» Centre is established.		110 mln roubles	110 mln roubles
	2015	Percentage of international patents – 10%.		110 mln roubles	110 mln roubles
	2016–2020	Mean annual revenue of each TPU academic cluster is more than 1 bln. Roubles.		4470 mln roubles	2760 mln roubles

Strategic Initiative 4. To attract young researchers and educational personnel which has experience in working for the leading national and international universities and research organisations

1.	Task 1	To attract young researchers and educational personnel which has experience in working for the leading national and international universities and research organisations			
	Target	Percentage of international professors, teachers and researchers among academic staff, including Russian citizens - PhD holders from international universities		Unit of measure percentage	
	2013	2014	2016	2017	2018
	0,1	1,0	5,0	10,0	10,0
	Ways of task realisation:	To foster creative and comfortable environment for teaching, learning and research. Perfection of the system for recruiting highly qualified specialists on the international job market especially talented young researchers. To launch Grant		Cost estimating (total and out of subsidies)	1314 mln roubles
		To foster creative and comfortable environment for teaching, learning and research. Perfection of the system for recruiting highly qualified specialists on the international job market especially talented young researchers. To launch Grant		Total	Financed from Federal Grant (subsidies) 994 mln roubles
				2019	2020
				10,0	10,0

		<p>Programme "Resource-efficiency Fellowship" for 3 months, one year, postgraduate studies, grants for groups of young researchers, reintegration grants for young researchers-compatriots. To delegate TPU staff to international research and educational centres for PhD studies.</p> <p>To work out suggestions with the purpose to introduce changes in legal basis for simplification of international mobility procedures.</p> <p>To foster bilingual campus environment.</p> <p>To provide young staff members and their families with housing and comfortable working conditions for the period of their work in the university. To provide support for academic staff and their family members relocating to Tomsk. Academic staff member salary is competitive on the world job market.</p>		
	Year	Main results:	Cost estimating	Including subsidies
	2013	Grant Program "Resource-efficiency Fellowship" is launched.	24 mln roubles	24 mln roubles
	2014	50 young scientists participate in Grant Program "Resource-efficiency Fellowship".	70 mln roubles	60 mln roubles
	2015	Housing and accommodation for young academic staff are provided.	70 mln roubles	60 mln roubles
	2016–2020	More than 400 young academic staff members are employed in the university.	1150 mln roubles	850 mln roubles

Strategic Initiative 5. To attract international students to study in Russian universities and deliver partnership programmes with international universities and their associations

1.	Task 1	To attract international students to study in Russian universities					Unit of measure	
	Target	Percentage of international students enrolled in main educational programmes of the University (including the students from Commonwealth of Independent States countries)					percentage	
	2013	2014	2015	2016	2017	2018	2019	2020
	17	18	19	20	22	23	24	25

Ways of task realisation:	To offer a wider range of educational programmes for foreign citizens and foster comfortable social environment.	Cost estimating (total and out of subsidies)	Total	Financed from Federal Grant (subsidies)
	<p>Perfection of collaboration strategy with international educational institutions at all levels. To expand the geographical area of applicants, including involvement of TPU alumni associations branches to this work.</p> <p>To involve recruiting agencies and media companies for enrolment. National and international mass media publish news and articles about TPU, news and articles about TPU in social media.</p> <p>To foster virtual learning environment using MOOCs. To develop educational programmes delivered in the medium of English. To deliver "double degree" programmes. International teachers and specialists participate in modules delivery. International accreditation of educational programmes.</p> <p>To upgrade students' academic adaptation system, tutoring (mentoring) system, to create unified centre for students support and services. To foster bilingual campus environment. To provide comfortable environment for living on the university campus.</p>		1422 mln roubles	1094 mln roubles
Year	Main results:		Cost estimating	Including subsidies
2013	International accreditation of educational programmes.		28 mln roubles	20 mln roubles
2014	Registration office ("Unified office" for students support and services) is developed and launched.		101 mln roubles	81 mln roubles
2015	Virtual learning platform for pupils (Internet-Lyceum) is developed and launched. 20 educational programmes are delivered in the medium of English.		110 mln roubles	90 mln roubles
2016–2020	Educational programmes are delivered within the framework of module-based student-centred approach. 30 double degree programmes are delivered. A dormitory for students is built.		1183 mln roubles	903 mln roubles

Strategic Initiative 6. To deliver new educational programmes in collaboration with leading national and international universities and research organisations

1.	Task 1		To attract young talents to relevant and actual educational programmes.					Unit of measure		
	Target	Average Unified State Exam score for the university full-time students enrolled in bachelor degree and specialists training programmes funded by federal budget	2015	2016	2017	2018	2019	2020	score	
	2013	2014	71	73	77	81	84	85		
	68	69								
	Ways of task realisation:		<p>To modernise educational programmes in compliance with international standards. To design and deliver educational programmes within the framework of interdisciplinary approach. To modernise and develop educational programs in the interests of University partners. To design and deliver double degree programmes with leading national and international universities, state academies of sciences. To develop and deliver educational modules on the issues of resource efficiency, engineering leadership, innovations and entrepreneurship. To upgrade virtual learning environment within the framework of Smart-education principles. To develop software systems for education process management, learning materials development. To purchase and upgrade laboratory equipment and software.</p>					Cost estimating (total and out of subsidies)	Total	<i>Financed from Federal Grant (subsidies)</i> 1878 mln roubles
			Main results:					Cost estimating	Including subsidies	
	Year		<p>TPU network educational standard is developed. Learning materials open storage is launched. Software systems "Teacher's Individual plan", "Educational program design", "Students project work organisation" are implemented. Educational programmes are modernised in compliance with international standards and principles of learning process organisation (within CDIO initiative). Virtual learning environment is enhanced. System of complex electronic document circulation for education process management is upgraded. At least 45 programmes, including 15 programmes of life-long learning education are developed and delivered. All learning resources and programmes laboratory base conform to international standards.</p>					110 mln roubles	90 mln roubles	
	2013							168 mln roubles	128 mln roubles	
	2014							170 mln roubles	130 mln roubles	
	2015							1790 mln roubles	1530 mln roubles	
	2016–2020									

Strategic Initiative 7. To concentrate resources on breakthrough fields, review and abandon non-effective activities

1.	Increase of income and concentration of the resources on breakthrough fields. Rejection of non-effective activities															
Task 1	Percentage of income from non-budgetary sources in the revenue structure of the university															
Target	2013		2014		2015		2016		2017		2018		2019		2020	
	47,5		56,2		58,7		61,3		63,6		65,8		65,8		65,8	
	Ways of task realisation:										Cost estimating (total and out of subsidies)	Total	184 mln roubles	Financed from Federal Grant (subsidies) 0 roubles		
	<p>To increase efficient use of all University resources.</p> <p>To transform TPU into research university with the focus on graduate and postgraduate programmes.</p> <p>Generate substantial income by increased number of fundamental and applied RTD projects, intellectual property rights, commercialisation of research results and endowment campaigns.</p> <p>To upgrade University staff incentives system. To develop and implement effective fixed-term contract system.</p> <p>To shift from enrolment for part-time study programmes to full-time programmes. To revise and abandon non-effective activities. To provide outsourcing of non-core activities. To allocate substantial budget for strategic development projects. To keep the balance between expenses for facilities maintaining and construction of new facilities for research, teaching and learning.</p> <p>To develop and launch software system for real-time exchange and processing of financial and economic documentation. To implement the Organisation Resources Planning system (ERP-system).</p>															

Year	Main results:	Cost estimating	Including subsidies
2013	System for structural units performance monitoring is launched. Software system for procurement procedures and services agreements is launched.	12 mln roubles	0 roubles
2014	Software system for exchange and processing of financial and economic documentation is launched.	20 mln roubles	0 roubles
2015	Effective fixed-term contract system is developed and launched. Activities of all non-effective units are revised and abandoned if necessary.	42 mln roubles	0 roubles
2016-2020	Percentage of income from research and innovation, of federal targeted grant programmes is up to 58% of consolidated budget. Increase of percentage for strategic development projects funding is up to 50 %.	110 mln roubles	0 roubles

Strategic Initiative 8. To enhance competences of University managerial personnel by forming talented managerial personnel database and assigning specialists who have managerial work experience in leading national and international universities and research organisations to managerial positions

1.	Task 1	To assign specialists who have managerial work experience in leading national and international universities and research organisations to managerial positions. To form TPU talented managerial personnel database.						
	Target	Number of specialists who have managerial work experience in leading national and international universities and research organisations to work in university administration and projects leaders				Unit of measure person		
	2013	2014	2015	2016	2017	2018	2019	2020
	3	5	10	15	20	25	30	32
	Ways of task realisation:	To upgrade the system for recruiting highly qualified experts from the world job market. To form TPU talented managerial personnel database. Perfection of TPU Personnel Development Programme. To develop competencies framework for managerial personnel. To attract talented managers from the international job market to TPU job positions. To form the institute of foreign experts acting as the rector's advisors. To provide social support for new managerial personnel. To foster bilingual campus environment. To set competitive level of				Cost estimating (total and out of subsidies) Total 687 mln roubles	Financed from Federal Grant (subsidies) 517 mln roubles	

		salary. To provide social and medical insurance. To provide social support for a visiting specialist and his/her family members in relocating to TPU. To provide possibilities for spouse employment. To run short-term managerial trainings in TPU and partner-universities for TPU managerial personnel. To increase enrolment to professional training in university management for managerial personnel, including enrolment to TPU master degree in university management. To work out suggestions with the purpose to introduce changes in legal basis for simplification of international mobility procedures.			
	Year	Main results:		Cost estimating	Including subsidies
	2013	TPU Personnel Development Programme is run. TPU talented managerial personnel database is constantly updated.		20 mln roubles	15 mln roubles
	2014	Managerial trainings in TPU and partner-universities for TPU talented managerial personnel are realised. Managerial vacancies are published internationally. Specialists who have managerial work experience in leading national and international universities and research organisations work at TPU managerial positions.		35 mln roubles	25 mln roubles
	2015	30% of TPU top administration have working experience leading national and international universities and research organisations. 20% TPU talented managerial personnel possess MBA or master degree in university management.		50 mln roubles	25 mln roubles
	2016–2020	Visiting specialists work in TPU administration.		582 mln roubles	452 mln roubles

Strategic initiative 9. *Perfection of postgraduate studies*

1.	Task 1	Perfection of graduate and postgraduate studies.						
	Target	Percentage of graduate and postgraduate students in the total number of full-time students			Unit of measure			
	2013	2014	2015	2016	2017	2018	2019	2020
	22	24	26	29	34	40	47	55

	Ways of task realisation:	<p>To transfer TPU to the university with the focus of graduate and postgraduate education. To develop and deliver internationally recognised programmes for graduate and postgraduate training in priority development fields of TPU academic clusters. To develop graduate and postgraduate programmes in the interests of the university partners. To modernise full-time postgraduate studies. To launch Grant Program for admission to graduate and postgraduate programmes run within the framework of current actual research projects. To develop grants and fellowship system. To provide unique material and technical resources and facilities for research. To provide conditions for distinguished researchers leadership of international projects and laboratories at TPU. To delegate TPU staff for PhD studies to leading universities and research centres. To foster comfortable conditions for studies, work and living.</p>	Cost estimating (total and out of subsidies)	Total	Financed from Federal Grant (subsidies)
	Year	Main results:		Cost estimating	Including subsidies
	2013	Grants and fellowship system for admission to graduate and postgraduate programmes run within the framework of current actual research projects is launched.		24 mln roubles	12 mln roubles
	2014	Internationally recognised programmes for graduate and postgraduate training in priority development fields of TPU academic clusters are developed. Distinguished researchers lead international projects and laboratories at TPU.		75 mln roubles	50 mln roubles
	2015	Graduate and postgraduate programmes in the interests of the university partners are developed and delivered. Interdisciplinary teams of graduate and postgraduate students for research within the framework of TPU academic clusters of Centre of Excellence “Resource-efficient Technologies” are formed and constantly reviewed.		80 mln roubles	50 mln roubles
	2016–2020	Percentage of international postgraduate students and postdocs is at least 10%. Percentage of postgraduate students enrolled in PhD studies is 20 %.		736 mln roubles	542 mln roubles

Strategic Initiative 10. To organise international and Russian academic mobility and professional training programmes for university academic staff

1	Task 1		To foster academic mobility system for professional competences development					Unit of measure		
	Target		Percentage of academic staff who participated in programmes of international and Russian academic mobility over the last two years					2019	2020	
	2013	2014	2015	2016	2017	2018	2019	2020		
	20	25	35	45	55	60	60	60		
	Ways of task realisation:		<p>To develop professional, foreign language, social and cultural competences framework of TPU staff.</p> <p>To deliver educational programmes within the framework of module-based approach.</p> <p>Perfection of academic mobility and professional training plans in compliance with the University goals and staff competencies framework. To run academic mobility programmes with partner organisations.</p> <p>To provide conditions for TPU staff to participate in academic and industry mobility programs and professional trainings in research and educational organisations and enterprises not less than 2 times in 3 years (one for each mobility type). To provide conditions for the third party specialists and representatives to deliver professional training programmes at TPU. To monitor and upgrade the staff competencies framework. To constantly implement academic and industry mobility programmes` results and professional training programmes` results into research, teaching and learning.</p>					Cost estimating (total and out of subsidies)	Total	Financed from Federal Grant (subsidies)
							838 mln roubles		548 mln roubles	
	Year	Main results:							Cost estimating	Including subsidies
	2013	Professional training programmes are modernised. Agreements about industry mobility professional trainings with university partners are signed. Staff competencies framework is implemented. Academic and industry mobility programs for 93 TPU staff members and professional training for 93 TPU staff members are organised.							39 mln roubles	22 mln roubles

	2014	Kit of professional training and academic and industry mobility programmes is modernised and developed. Academic and industry mobility programs for 152 TPU staff members and professional training for 152 TPU staff members are organised.					64 mln roubles	43 mln roubles
	2015	Academic and industry mobility programs for 166 TPU staff members and professional training for 166 TPU staff members are organised.					70 mln roubles	48 mln roubles
	2016–2020	Academic and industry mobility programs for 335 TPU staff members and professional training for 335 TPU staff members are organised.					665 mln roubles	435 mln roubles
2.	Task 2	Implementation of academic mobility system with the purpose of enhancing TPU academic staff experience in development of educational resources in the medium of English					Unit of measure percentage	
	Target	Percentage of educational programmes delivered in the medium of English						
	2013	2014	2015	2016	2017	2018	2019	2020
	6	8	12	16	20	24	28	30
	Ways of task realisation:	<p>To update the system of academic mobility and professional training abroad with the purpose of modernising TPU educational programmes.</p> <p>Perfection of academic mobility and professional training according to the needs in development and delivery of modernised and new educational programmes delivered in the medium of English. To run academic mobility programmes with international partner organisations.</p> <p>To organise academic mobility and professional training in leading international universities, research organisations and industry. To develop teaching materials for educational programmes delivered in the medium of English as a result of international academic mobility programmes and professional training. To provide expert evaluation of developed teaching materials by representatives of leading international universities and research organisations.</p>					Cost estimating (total and out of subsidies)	<i>Total</i> 829 mln roubles <i>Financed from Federal Grant (subsidies)</i> 529 mln roubles
	Year	Main results:					Cost estimating	Including subsidies
	2013	17 international academic staff members deliver TPU educational programmes in the medium of English. 85 TPU academic staff members participate in academic mobility programmes in leading international universities and research centres.					36 mln roubles	21 mln roubles

2014	28 international academic staff members deliver TPU educational programmes in the medium of English. 142 TPU academic staff members participate in academic mobility programmes in leading international universities and research centres.	60 mln roubles	40 mln roubles
2015	30 international academic staff members deliver TPU educational programmes in the medium of English. 145 TPU academic staff members participate in academic mobility programmes in leading international universities and research centres.	61 mln roubles	40 mln roubles
2016–2020	70 international academic staff members deliver TPU educational programmes in the medium of English annually. 260 TPU academic staff members participate in academic mobility programmes in leading international universities and research centres annually.	672 mln roubles	428 mln roubles

Strategic Initiative 11. To develop compulsory supplementary strategic initiatives plan

1. Task 1		Realisation of compulsory supplementary strategic initiatives				Unit of measure Non-measurable					
Target	Realization of the compulsory supplementary activities plan										
	2013	2014	2015	2016	2017	2018	2019	2020			
Ways of task realisation:	+	+	+	+	+	+	+	+			
	<p>To develop programme roadmap with independent consultant.</p> <p>To develop compulsory supplementary strategic initiatives plan, work out drafts of regulatory acts and internal protocols within the applicable active legislation providing the following:</p> <ul style="list-style-type: none"> • change of institution statute, • procedure of assignment the university rector by the Ministry of Science and Education of Russian Federation, • introduction of changes and supplements into contracts of rector and vice-rectors. <p>To develop plan of actions for rendering accounting reports in compliance with International Financial Reporting Standards (IFRS).</p> <p>To provide annual reporting to international ranking systems.</p>							Cost estimating (total and out of subsidies)	Total	159 mln roubles	Financed from federal grant (subsidies) 0 roubles

		To set criteria for measuring academic performance of academic staff and launch the system of personalised effective contracts (employment contracts).			
Year	Main results:		Cost estimating	Including subsidies	
2013	<p>Strategic initiatives plan to increase of TPU competitiveness among leading world's research and educational centres is developed, agreed and launched.</p> <p>Plan of actions, drafts of regulatory acts and internal protocols within the applicable active legislation providing the following:</p> <ul style="list-style-type: none"> • change of institution statute, • procedure of assignment the university rector by the Ministry of Science and Education of Russian Federation, • new employment contracts for rector and vice-rectors. <p>Accounting policies are executed in compliance with IFRS.</p> <p>Chart of accounts and analysis data for reports formation in compliance with IFRS is performed.</p> <p>Annual reporting to international ranking systems is performed.</p> <p>Teaching staff academic performance ranking is upgraded.</p>	50 mln roubles	0 roubles		
2014	<p>Financial reports 2013 are executed based on transformation method according to Russian Accounting Principles in compliance with IFRS.</p> <p>System of effective contracts for teaching staff is introduced.</p> <p>Personal effective contracts for teaching staff, whose current employment contracts expire in 2015 are launched.</p>	12 mln roubles	0 roubles		
2015	<p>Reporting is performed in compliance with IFRS with audit report for 2014.</p> <p>Teaching staff academic performance ranking is upgraded.</p> <p>Teaching staff, whose employment contracts expire in 2015, are transferred to the system of personal effective contracts.</p> <p>Personal effective contracts package for teaching staff, whose current employment contracts expire in 2016 are launched.</p> <p>Teaching staff incentives system is revised and upgraded.</p>	13 mln roubles	0 roubles		
2016–2020	<p>Reporting is performed in compliance with IFRS with audit report for 2015 as well as for consequent years.</p> <p>Teaching staff academic performance ranking is revised and upgraded.</p> <p>All teaching staff members are transferred to the system of personal effective contracts.</p>	84 mln roubles	0 roubles		

**SUMMARY TABLE OF FINANCING REQUIREMENT FOR STRATEGIC PROGRAMME ON NATIONAL RESEARCH TOMSK POLYTECHNIC UNIVERSITY
COMPETITIVENESS ENHANCEMENT IN THE GROUP OF TOP LEVEL WORLD RESEARCH AND ACADEMIC INSTITUTIONS**

Mln roubles

Strategic Initiative	Amount of finance		By year							
	Total	Including subsidy	2013		2014		2015		2016–2020	
			Total	Including Subsidy	Total	Including Subsidy	Total	Including Subsidy	Total	Including Subsidy
1	2	3	4	5	6	7	8	9	10	11
Strategic Initiative 1. Realisation of activities for strategic partnership and network cooperation	1,109.0	0.0	24.0	0.0	50.0	0.0	50.0	0.0	985.0	0.0
Strategic Initiative 2. Support of graduate and postgraduate students, interns, young research and teaching staff members	5,114.0	4,142.0	89.0	77.0	398.0	248.0	354.0	227.0	4,273.0	3,590.0
Strategic Initiative 3. Realisation of fundamental and applied research projects on national and international research priorities	9,941.0	6,144.0	294.0	219.0	447.0	325.0	430.0	330.0	8,770.0	5,270.0
Strategic Initiative 4. To attract young researchers and educational personnel which has experience in working for the leading national and international universities and research organisations	1,314.0	994.0	24.0	24.0	70.0	60.0	70.0	60.0	1,150.0	850.0
Strategic Initiative 5. To attract international students to study in Russian universities and deliver partnership programmes with international universities and their associations	1,422.0	1,094.0	28.0	20.0	101.0	81.0	110.0	90.0	1,183.0	903.0

Strategic Initiative 6. To deliver new educational programmes in collaboration with leading national and international universities and research organisations	2,238.0	1,878.0	110.0	90.0	168.0	128.0	170.0	130.0	1,790.0	1,530.0
Strategic Initiative 7. To concentrate resources on breakthrough fields, review and abandon non-effective activities	184.0	0.0	12.0	0.0	20.0	0.0	42.0	0.0	110.0	0.0
Strategic Initiative 8. To enhance competences of University managerial personnel by forming talented managerial personnel database and assigning specialists who have managerial work experience in leading national and international universities and research organisations to managerial positions	687.0	517.0	20.0	15.0	35.0	25.0	50.0	25.0	582.0	452.0
Strategic Initiative 9. Perfection of postgraduate studies	915.0	654.0	24.0	12.0	75.0	50.0	80.0	50.0	736.0	542.0
Strategic Initiative 10. To organise international and Russian academic mobility and professional training programmes for university academic staff	1,667.0	1,077.0	75.0	43.0	124.0	83.0	131.0	88.0	1,337.0	863.0
Strategic Initiative 11. To develop compulsory supplementary strategic initiatives plan	159.0	0.0	50.0	0.0	12.0	0.0	13.0	0.0	84.0	0.0
TOTAL on Strategic Initiatives	24,750.0	16,500.0	750.0	500.0	1,500.0	1,000.0	1,500.0	1,000.0	21,000.0	14,000.0