



SCIENCE & TECHNOLOGY
CENTER IN UKRAINE



2006 Annual Survey

Kiev

TABLE OF CONTENTS

Introduction to STCU Annual Survey	2	- Scientific Publications in 2006	11
Evaluation of Technical Unit Self-Sustainability	2	Summary of STCU Impact on Responding Georgian	
- Description of criteria which were used to evaluate the		Technical Units (2006)	11
sustainability	2	UKRAINE	12
- Definition of Sustainability Categories	2	Key Findings from Responding Ukrainian Technical Units ...	12
- Sustainability of Technical Units by countries	3	Background	12
- Comparing 2006 Sustainability Evaluation of		Technical Units Sustainability Evaluation	12
Ukrainian TUs with 2005 Survey Results	3	- Sustainability Evaluation of Ukrainian Technical Units	12
AZERBAIJAN	4	Financing Sources	13
Key Findings from Azeri Technical Units	4	- Source of Budgetary Financing for Technical Units	13
Background	4	Characteristic of Technical Units	13
Technical Units Sustainability Evaluation	4	- Quantity of STCU Projects	14
- Sustainability Evaluation of Azeri Technical Units	4	Areas of Research Focus	14
Financing Sources	5	Collaboration with Foreign Countries	14
- Source of Budgetary Financing for Technical Units	5	Profile of Technical Unit Scientists	14
Characteristic of Technical Units	5	- Average Age of Scientists in Responding TUs	14
- Quantity of STCU Projects	5	- Proportions of Scientists in Responding TUs, by Age	14
Areas of Research Focus	5	STCU Impact on Promoting S&T Excellence	14
Collaboration with Foreign Countries	5	Technology Promotion & Patenting	14
Profile of Technical Unit Scientists	6	- Technologies Reported by Responding TUs (2006)	14
- Average Age of Scientists in Responding TUs 6		- Patenting Reported by Responding TUs	15
- Proportions of Scientists in Responding TUs, by Age 6		Level of International Collaboration & Scientific Activity ...	15
STCU Impact on Promoting S&T Excellence	6	- International Collaborative Activities in 2006	15
Technology Promotion & Patenting	6	- Scientific Publications in 2006	15
- Technologies Reported by Responding TUs (2006) 6		Summary Comparison of STCU Impact on Ukrainian	
- Patenting Reported by Responding TUs (2006)	6	Technical Units (2006 and 2005 Surveys)	16
Level of International Collaboration & Scientific Activity ...	6	UZBEKISTAN	17
- International Collaborative Activities in 2006	6	Key Findings from Uzbek Technical Units	17
- Scientific Publications in 2006 7		Background	17
Summary of STCU Impact on Responding Azeri		Technical Units Sustainability Evaluation	17
Technical Units (2006)	7	- Sustainability Evaluation of Uzbek Technical Units	17
GEORGIA	8	Financing Sources	18
Key Findings from Responding Georgian		- Source of Budgetary Financing for Technical Units	18
Technical Units	8	Characteristic of Technical Units	18
Background	8	- Quantity of STCU Projects	18
Technical Units Sustainability Evaluation	8	Areas of Research Focus	18
- Sustainability Evaluation of Georgian Technical Units	8	Collaboration with Foreign Countries	18
Financing Sources	9	Profile of Technical Unit Scientists	18
- Source of Budgetary Financing for Technical Units	9	- Average Age of Scientists in Responding Uzbek TUs	18
Characteristic of Technical Units	9	- Proportions of Scientists in Responding Uzbek TUs, by Age .	19
- Quantity of STCU Projects	9	STCU Impact on Promoting S&T Excellence	19
Areas of Research Focus	9	Technology Promotion & Patenting	19
Collaboration with Foreign Countries	9	- Technologies Reported by Responding TUs (2006)	19
Profile of Technical Unit Scientists	10	- Patenting Reported by Responding TUs (2006)	19
- Average Age of Scientists in Responding TUs	10	Level of International Collaboration & Scientific Activity ...	19
- Proportions of Scientists in Georgian TUs, by Age	10	- International Collaborative Activities in 2006	19
STCU Impact on Promoting S&T Excellence	10	- Scientific Publications in 2006	19
Technology Promotion & Patenting	10	Summary of STCU Impact on Responding Uzbek Technical	
- Technologies Reported by Responding TUs (2006)	10	Units	20
- Patenting Reported by Responding TUs (2006)	10	Summary of STCU Impact on Responding Technical Units, by	
Level of International Collaboration & Scientific Activity ...	10	Country and in Total (2006)	21
- International Collaborative Activities in 2006	10		

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Introduction

In January 2006 – March 2007, STCU conducted a survey of Technical Units (TUs) with active STCU projects to evaluate their level of self-sustainability and the impact of STCU projects and supplemental programs. This was the second such annual survey conducted by STCU and it was the first survey conducted in all STCU Recipient member countries.

The STCU annual survey was first developed in 2005 by joint effort between STCU and National Academy of Sciences of Ukraine (NASU) through the Dobrov Center for Scientific and Technological Potential and Science History Studies. The Dobrov Center produced the methodology for sustainability and performance evaluation of institutes and research technical units using data gathered by a survey, and this same methodology was used in the 2006 survey.

In the 2005 survey, questionnaires were sent only to Ukrainian institutes under NASU. In 2006, the survey was expanded to TUs in all the STCU Recipient Parties — Azerbaijan, Georgia, Ukraine, and Uzbekistan, except Moldova (no projects). Questionnaires were sent to 315 Technical Units and STCU received responses from 218 TUs, for an overall response rate of 70%.

Evaluation of Technical Unit Self-Sustainability

The following criteria used to evaluate unit self-sustainability level was developed by the Dobrov Center in 2005.

Table 1. Description of criteria which were used to evaluate the sustainability

#	Criteria	Description
1	Presence of non-government financing	Reflects the level of intensity of relations between business and the unit. If these relations are stable, the unit could potentially commercialize its results and receive extra income
2	Share of budget devoted to the applied research	Min 10% of TU budget; reflects more 'practical' orientation of the unit
3	Differentiation of sources of non-government financing	Presence of not less than two financing sources; reflects the possibility of the unit receiving money from different sources that theoretically could allow the continuation of activities even after one source disappears
4	Number of publications in referred foreign journals	At least two such publications per unit; reflects the unit's connection to the external science communities and its credibility within those communities
5	Presence of contract with foreign partner	At least one; reflects unit's capability to attract contract research from outside sources, and the unit's connection/credibility with external customers
6	Number of technologies which are commercialized	At least one of such technology; reflects the unit's potential to attract external, commercial technology financing
7	Certain level of young researchers in the TU	not less than 5%; reflects unit's recruiting ability and attractiveness to new researchers, as a measure of the unit's long-term viability
8	Relatively young average age of researchers	not higher than 55; reflects the unit's ability to retain newly recruited researchers, as well as its future R&D capability and viability

Definition of Sustainability Categories

Four categories of sustainability were defined based on the sustainability criteria, in order to group the respondent TUs. The first three criteria (highlighted) represent an assumed minimum threshold for self-sustainability. The additional criteria provide a measure of the depth/strength of the technical unit's sustainability.

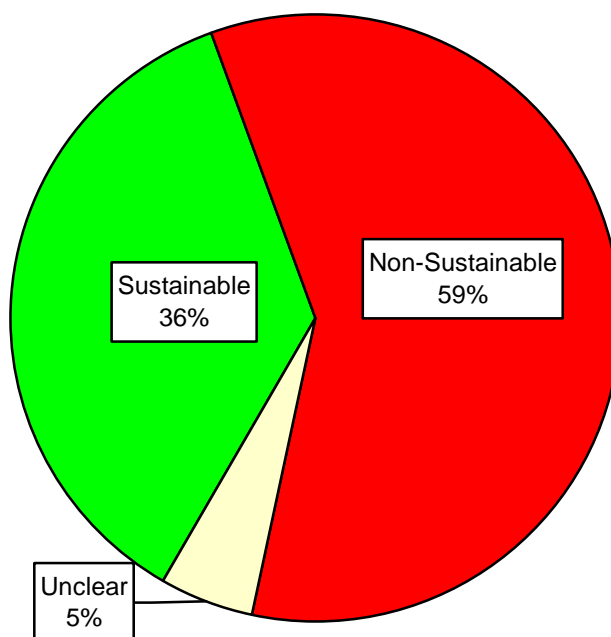
- Sustainable Technical Units: Units in which the responses fulfilled Criteria 1, 2, and 3, and at least one of Criteria 4-6.
- Extra Sustainable Technical Units: Units in which the responses fulfilled all eight sustainability criteria.
- Non-Sustainable Technical Units: Units in which the responses failed to meet Criteria 1-3.

The table below summarizes the share of respondents that were determined to fall into one of the levels of sustainability. In all, 36 % of the respondent TUs were evaluated as sustainable and 59% as non- sustainable, with 5% not having enough information to make a sustainability evaluation.

Table 2. Sustainability of Technical Units by countries

	AZ	GE	UA	UZ	Total
Sustainable units	3 (33%)	7 (37%)	63 (39%)	5 (17%)	78 (36%)
<i>including Extra Sustainable units</i>	1 (11%)	1 (5%)	7 (4%)	-	9 (4%)
Non-sustainable units	6 (67%)	11 (57%)	92 (58%)	20 (66%)	129 (59%)
Units with unclear status (not enough data for ranking)	-	1 (5%)	5 (3%)	5 (17%)	11 (5%)

Sustainability of Responding TUs, 2006



Comparing 2006 Sustainability Evaluation of Ukrainian TUs with 2005 Survey Results

Because the 2005 STCU Survey was given only to Ukrainian (NASU) institutes/TUs, only a comparison between Ukrainian technical units can be performed with the 2006 data. Approximately the same number of Ukrainian TUs was approached for the 2006 survey as for the 2005 survey, and there was approximately the same number of respondents in both the 2006 and 2005 surveys.

Interestingly, the 2006 survey showed an increase in the percentage of TUs that met the “sustainable unit” threshold, relative to the 2005 survey data. There was also roughly no change in the number of TUs meeting the “non-sustainable unit” category, but a dramatic decline in the number of TUs where there was not enough data to make a sustainability evaluation. It would appear that more Ukrainian TUs provided enough data in 2006 to make a sustainability evaluation than was the case in 2005, and that this new information may have raised the percentage of Ukrainian TUs fulfilling the “sustainable unit” definition.

<u>Ukrainian Technical Units</u>	2006	2005
Sustainable units	63 (39%)	46 (25%)
<i>including Extra Sustainable units</i>	7 (4%)	N/A
Non-sustainable units	92 (58%)	91 (49%)
Units with unclear status (not enough data for ranking)	5 (3%)	49 (26%)



AZERBAIJAN

Key Findings from Azeri Technical Units:

1. Questionnaires were sent to 10 Azeri Technical Units (TUs) with active STCU projects in 2006. Of these, 9 TUs provided responses, for a 90% response rate.
2. Of the Azeri respondents, 3TUs (33 % of the respondents) were evaluated as sustainable and 1 TU was evaluated as extra sustainable.
3. The majority of the respondents' financing (58%) comes from the national government. STCU grants make up 21% of the respondents' financing, which equates to 50% of all the non-government financing received.
4. Participation in international conferences and joint publications were the most popular forms of collaboration reported, however the STCU impact in these activities appears relatively low. No respondent requested STCU assistance in technology promotion, but STCU activities are only 2 years old and not yet fully developed in Azerbaijan.
5. An accurate estimation of STCU involvement at the technical unit level is somewhat impeded by data about the whole institute (4 respondents provided institute-wide responses and not TU specific responses).

Background

Questionnaires were sent to 10 Azeri Technical Units (TUs) with active STCU projects in 2007. Of these, 9 TUs provided responses, for a 90% response rate. However, four of the responding TUs gave information about their whole institutes, rather than just on the TU itself. This makes comparison of the responses across all the Azeri TUs difficult.

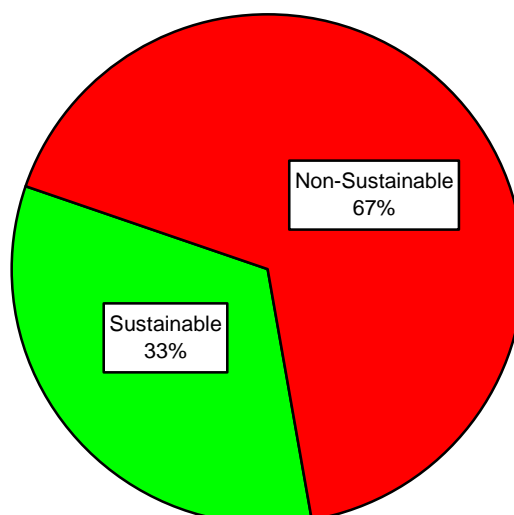
Technical Units Sustainability Evaluation

Using the sustainability criteria described earlier, the responding Azeri TUs were categorized accordingly, using the data drawn from the TU responses to the questionnaire.

Table AZ-1. Sustainability Evaluation of Azeri Technical Units

	Quantity	%
Sustainable units	3	33%
<i>including Extra Sustainable units</i>	<i>(1)</i>	<i>(11%)</i>
Non-sustainable units	6	67%
Units with unclear status (not enough data for ranking)	0	0

Sustainability of Responding Azeri TUs

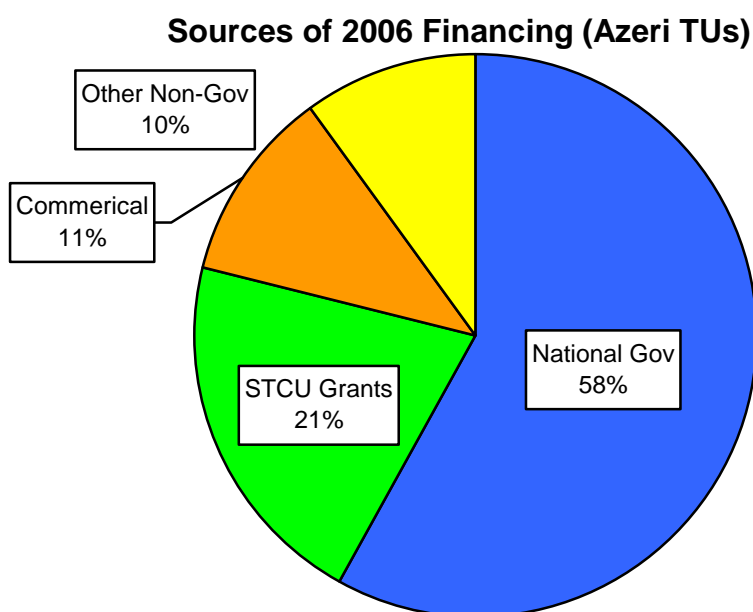


Financing Sources

The majority of the respondents' financing (58%) comes from the national government. According to the responding TU data, STCU grants made up 21% of the respondents' financing, which equates to 50% of all the non-government financing received by these TUs.

Table AZ-2. Source of Budgetary Financing for Technical Units

Source of Financing	% of Total
National Government	58%
Non-Government	42%
• <i>Share from STCU Grants</i>	21%
• <i>Share from Private Commercial Entities</i>	11%
• <i>Share from Other Domestic Non-Government Organizations (except STCU)</i>	8%
• <i>Share from Foreign Non-Government Organizations (except STCU)</i>	2%



Characteristic of Technical Units

Table AZ-3. Quantity of STCU Projects

	# of Responding TUs	% of Total
# of Responding TUs with 1STCU Project	6	67%
# of Responding TUs with 2 Projects	3	33%
# of Responding TUs with 3 Projects	-	-
# of Responding TUs with 4 Projects	-	-
# of Responding TUs with 5 Projects	-	-

Areas of Research Focus

The main research directions reported by the responding Azeri TUs were: physics, hydrocarbon (oil)-related research, biology, aerospace, chemistry, ecology.

Collaboration with Foreign Countries

The responding Azeri TUs reported scientific contacts with the USA and Russia (the most often), also with Ukraine, Italy, and less often with Germany, France, and Turkey. Other contacts had involved Belgium, Spain, Kazakhstan, China, Saudi Arabia, Romania, Japan, Belarus, and Bulgaria.

Profile of Technical Unit Scientists

Table AZ-4. Average Age of Scientists in Responding Azeri TUs

	Average Age (years)
All Researchers	44
Doctors of Science	53
Candidate of Science (PhD equivalent)	50

Table AZ-5. Proportions of Scientists in Responding Azeri TUs, by Age

Name	%
Under 35 years old	12%
Retired	26%

STCU Impact on Promoting S&T Excellence

Technology Promotion & Patenting

Over half of the responding TUs reported technologies ready for market, and 83% of these technologies are patented. The number of reported technologies is relatively large as there were only 9 responding Azeri TUs. None of the Azeri TUs applied for STCU technology promotion assistance.

Table AZ-6. Technologies Reported by Responding TUs (2006)

	Quantity	% of Total
Technologies, total	35	100%
- implemented in the market	2	5.7%
- patented	29	83%
- supported by a business plan	4	11%
- supported by marketing research	2	5.7%
- applied for STCU technology promotion assistance (e.g., patent support, etc.)	-	-

* Total percentage exceeds 100% because respondents could choose multiple categories in the question

Table AZ-7. Patenting Reported by Responding TUs (2006)

Name	Quantity	With STCU assistance	
Patents Received, total	5	-	-
National (Azeri) Patents Applications	5	-	-
Foreign or International Patent Applications	-	-	-

Level of International Collaboration & Scientific Activity

Participation in international conferences and joint publications were the most popular forms of collaboration reported by the responding Azeri TUs. The impact of STCU appears relatively low, but this may not be the actual case as data in 4 questionnaires were given about the entire institute and not only the TUs where the STCU projects are taking place.

Table AZ-8. International Collaborative Activities in 2006

Name	Quantity	With STCU assistance	
Participation in the International Conferences, Total	161	13	8%
• within the country	76	7	9%
• Abroad	85	6	7%
Joint Publications	137	5	3%
Joint Scientific Projects	30	10	33%
Contracts with Business Partners, Total	20	3	15%
• within the country	16	1	6%
• From Abroad	4	2	50%
Training Abroad	-	-	-

Table AZ-9. Scientific Publications in 2006

	Quantity	With STCU assistance (and % of total)	
Monographs, total	11	-	-
• within the country	9	-	-
• Abroad	2	-	-
Articles	233	10	3%
• within the country	184	6	3%
• Abroad	49	4	8%
Abstracts Submitted to Conferences	126	24	16%
• within the country	58	7	12%
• Abroad	68	17	25%

Summary of STCU Impact on Responding Azeri Technical Units (2006)

	Quantity (or % of Total)
Technical Units (TUs) to which Questionnaires were sent	10
TUs which responded to Questionnaires	9 (90%)
Source of Financing (budget of TUs)	
National Government	58%
Non-government	42%
- STCU Share of Total Budget (Government + Non-government Financing)	21%
- STCU Share of Non-government Funding Portion	50%
Technical Unit Sustainability Evaluation	
Sustainable units	3 (33%)
<i>including</i> Extra Sustainable units	1 (11%)
Non-sustainable units	6 (67%)
Units with unclear status (not enough data for ranking)	-
Technologies that are Market-Ready	
	33
Areas of STCU Project and Supplemental Activities	
International Collaboration Supported by STCU	
Participation in International Conferences within Country	7 (9%)
" " " Conducted Abroad	6 (7%)
Joint Scientific Articles with Foreign Colleagues	5 (3%)
Participation in Joint Research Projects (with foreign partners)	10 (33%)
Contracts with Private Companies within the Country	1 (6%)
" " " From Abroad	2 (50%)
Participation in Training Programs Abroad	-
Scientific Publishing Activity Supported by STCU	
Scientific Articles within the Country	6(3%)
" " Abroad	4(8%)
Abstracts Submitted to Conferences within the Country	7(12%)
" " " Abroad	17(25%)
Patenting Activity Supported by STCU	
National Patents	-
Foreign/International Patents	-



GEORGIA

Key Findings from Responding Georgian Technical Units:

1. Questionnaires were sent to 24 Georgian Technical Units with active STCU projects in 2006. Of these, 19 TUs provided responses, for a 80% response rate.
2. Of the Georgian respondents, 7 TUs (37% of the respondents) were evaluated as sustainable and 1 TU was evaluated to be extra sustainable.
3. Non-government financing forms the biggest share (61%) of the responding TU financing. STCU grants hold make up a larger share of TUs' total financing than the share they receive from the national government (47% from STCU versus 39% from the government).
4. The influence of STCU on many indicators of international collaboration and scientific results is about ¼.

Background

Questionnaires were sent to 23 Georgian Technical Units (TUs) with active STCU projects in 2006. Of these, 19 TUs provided responses, for a response rate of 80%.

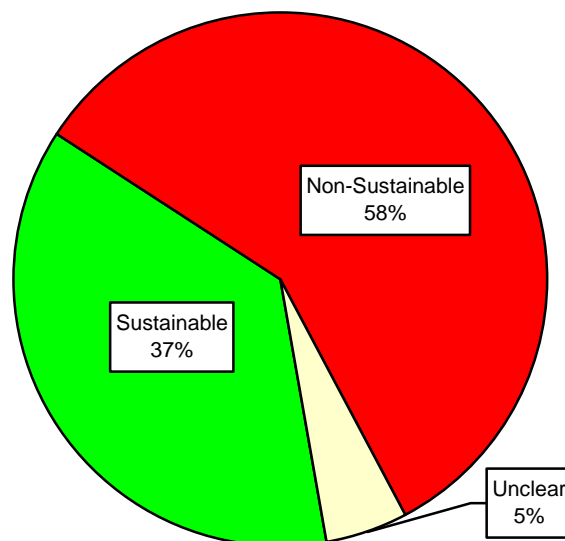
Technical Units Sustainability Evaluation

Using the sustainability criteria described earlier, the responding Georgian TUs were categorized accordingly, using the data drawn from the TU responses to the questionnaire.

Table GE-1. Sustainability Evaluation of Georgian Technical Units

Name	Quantity	%
Sustainable units	7	37%
<i>including Extra Sustainable units</i>	<i>(1)</i>	<i>(5%)</i>
Non-sustainable units	11	58%
Units with unclear status (not enough data for ranking)	1	5%

Sustainability of Responding Georgian TUs



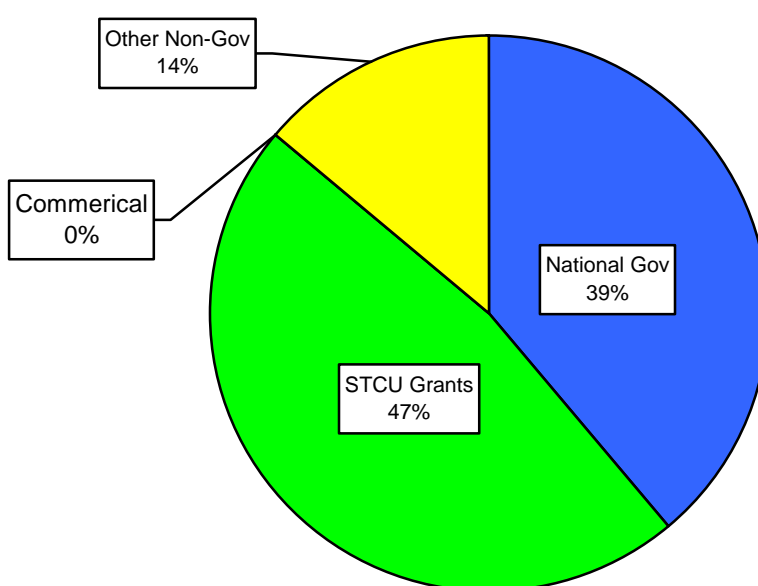
Financing Sources

Of the responding Georgia TUs, non-governmental financing formed the largest portion of the TU financing, amounting to over 60% of the TU budget. Among the sources of non-governmental funding, STCU grants held the dominant share (77% of the Non-governmental funding). In fact, STCU project grant funding formed nearly half of the Georgian TU financing (47%) and is larger than the portion of TU financing coming from the national government.

Table GE-2. Source of Budgetary Financing for Technical Units

Source of Financing	% of Total
National Government	39%
Non-government	61%
• <i>Share from STCU grants</i>	47%
• <i>Share from Private Commercial Entities</i>	-
• <i>Share from Other Domestic Non-Government Organizations (except STCU)</i>	2%
• <i>Share from Foreign Non-Government Organizations (except STCU)</i>	12%

Sources of 2006 Financing (Georgian TUs)



Characteristic of Technical Units

Table GE-3. Quantity of STCU Projects

	Number of Responding TUs	% of Total
# of Responding TUs with 1STCU Project	16	85%
# of Responding TUs with 2 Projects	1	5%
# of Responding TUs with 3 Projects	1	5%
# of Responding TUs with 4 Projects	-	-
# of Responding TUs with 5 Projects	1	5%

Areas of Research Focus

The main directions of research reported by the responding Georgian TUs were: biochemistry and biotechnology, physics, chemistry, biology, and astrophysics.

Collaboration with Foreign Countries

The responding Georgian TUs reported scientific contacts with such countries as the USA, Russia, Ukraine, Great Britain, Spain, Poland, Netherlands, France, Belgium, Greece, Bulgaria and others.

Profile of Technical Unit Scientists

Table GE-4. Average Age of Scientists in Responding Georgian TUs

Name	Average Age (years)
All Researchers	48
Doctors of Science	60
Candidate of Science (PhD)	49

Table GE-5. Proportions of Scientists in Responding Georgian TUs, by Age

Name	%
Under 35 years old	36%
Retired	35%

STCU Impact on Promoting S&T Excellence

Technology Promotion & Patenting

There are 35 technologies that the TUs felt were worth promoting to the market, and about 70% of these technologies are patented. Six of the technologies obtained national patents in 2006, all of which were obtained with assistance from STCU. Eleven national patent applications were submitted in 2006, eight of which made use of STCU assistance. In 2006, none of the TUs reported applying or obtaining patents outside of Georgia.

Table GE-6. Technologies Reported by Responding TUs (2006)

	Quantity	% of Total
Technologies, total	35	100%
- implemented in the market	9	26%
- patented	24	68%
- supported by a business plan	2	5.7%
- supported by marketing research	-	-
- applied to STCU technology promotion assistance (e.g., patent support, etc.)	2	5.7%

* Total percentage exceeds 100% because respondents could choose multiple categories in the question

Table GE-7. Patenting Reported by Responding TUs (2006)

Name	Quantity	With STCU assistance	
Patents Received , total	6	6	100%
National (Georgian) Patent Applications	11	8	72%
Foreign or International Patents Applications	-	-	-

Level of International Collaboration & Scientific Activity

Participation in international conferences and joint publications are the most popular forms of collaboration in all countries. The impact of STCU in these activities (as measured by the percentage share of STCU involvement) is mostly about 20-30 % of all foreign collaborative contacts.

Table GE-8. International Collaborative Activities in 2006

Name	Quantity	With STCU assistance	
Participation in the International Conferences, Total	72	20	28%
• within the country	15	3	20%
• Abroad	57	17	30%
Joint Scientific Articles with Foreign Colleagues	110	23	21%
Participation in Joint Research Projects (with foreign partners)	28	5	18%
Contracts with Business Partners, Total	6	2	33%
• within the country	2	-	-
• From Abroad	4	2	50%
Training Abroad	16	3	19%

Table GE-9. Scientific Publications in 2006

	Quantity	With STCU assistance	
Monographs, total	6	-	-
• within the country	4	-	-
• Abroad	2	-	-
Articles	149	35	23%
• within the country	63	19	30%
• Abroad	86	16	19%
Abstracts Submitted to Conferences	57	13	26%
• within the country	12	3	25%
• Abroad	45	10	22%

Summary of STCU Impact on Responding Georgian Technical Units (2006)

	Quantity (or %)
Technical Units (TUs) to which Questionnaires were sent	23
TUs which responded to Questionnaires	19 (80%)
Source of Financing (budget of TUs)	
National Government	39%
Non-government	61%
- STCU Share of Total Budget (Government + Non-government Financing)	47%
- STCU Share of Non-government Funding Portion	77%
Technical Unit Sustainability Evaluation	
Sustainable units	7 (37%)
<i>including Extra Sustainable units</i>	1 (5%)
Non-sustainable units	11 (58%)
Units with unclear status (not enough data for ranking)	1 (5%)
Technologies that are Market-Ready	26
Areas of STCU Project and Supplemental Activities	TUs using STCU Support
International Collaboration Supported by STCU	
Participation in International Conferences within Country	3(20%)
" " " Conducted Abroad	17(30%)
Joint Scientific Articles with Foreign Colleagues	23(21%)
Participation in Joint Research Projects (with foreign partners)	5(18%)
Contracts with Private Companies within the Country	-
" " " From Abroad	2(50%)
Participation in Training Programs Abroad	3(19%)
Scientific Publishing Activity Supported by STCU	
Scientific Articles within the Country	19 (30%)
" " Abroad	16 (19%)
Abstracts Submitted to Conferences within the Country	3 (25%)
" " " Abroad	10(22%)
Patenting Activity Supported by STCU	8 (72%)
National Patents	8 (72%)
Foreign/International Patents	-



UKRAINE

Key Findings from Responding Ukrainian Technical Units:

1. Questionnaires were sent to 297 active STCU projects located in Ukrainian scientific Technical Units. Of these, 220 responses were received, for a 74% response rate (the 220 responses came from 160 Ukrainian Technical Units, or TUs).
2. Of the Ukrainian respondents, 65 TUs (or about 39% of the respondents) were evaluated as sustainable (compared to 46 TUs, or about 25% of the total respondents, in the 2005 survey). About 92 TUs (or about 58% of the respondents) were evaluated as non-sustainable (almost the same number as in the 2005 survey). A greater number of TUs provided enough data to make a sustainability evaluation in 2006 than 2005.
3. Non-government financing was 43% of the Ukrainian respondents' budgetary funding, with 57% of financing coming from the national government (a slight shift towards governmental financing from the 2005 survey results). The share of total financing held by STCU grants increased in 2006 (28%) from the 2005 survey (20%), with STCU grants making up 65% of all non-government financing to the Ukrainian TUs (an increase from the 48% share in 2005).
4. In 2006, the creation of joint publications, joint scientific projects, contracts with business partners and trainings abroad showed increases from the 2005 data. At the same time, the STCU impact in these activities showed a decrease in 2006 from 2005 survey levels, except for contracts with business partners abroad.
5. Responding TUs reported many technologies ready for market, with 23% of technologies already applied in the marketplace. But only 10% of the reported technologies were supported by business plans, and only 8% have been market researched. Thus, the responding Ukrainian TUs showed a relative weakness in transferring technology, with few preparations or plans for effectively introducing their technologies into the market.
6. The impact of STCU on patenting appeared to increase in 2006 over 2005 for national patents, but decreased for foreign/international patents. Overall, the level of patenting in 2006 appears to have decreased from 2005.

Background

Of the 297 questionnaires sent to Ukrainian project managers with active STCU projects in 2006, 220 responses were received, for a response rate of 74%. The 220 project teams that responded to the 2006 survey were located in a total of 160 Technical Units (TUs) within Ukrainian scientific research institutes, universities, state and private enterprises. This compares with the 2005 survey, where 270 questionnaires were sent to 258 Ukrainian TUs with active STCU projects in 2005, and responses were received from 186 of those TUs (or a 72% response rate).

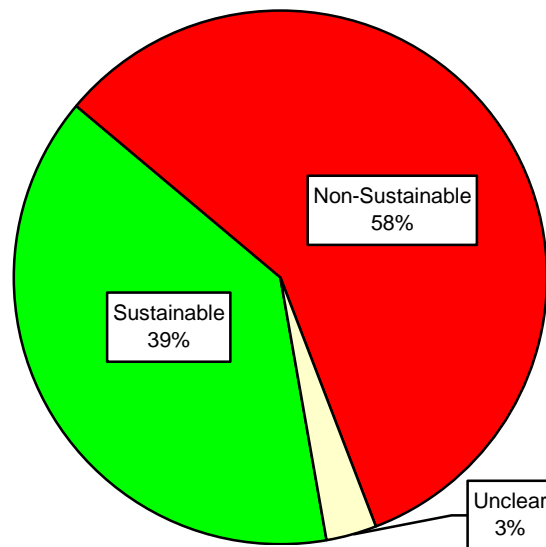
Technical Units Sustainability Evaluation

In 2006, 63 Technical Units (about 39% of total respondents) were evaluated as being sustainable (with 7 of those TUs evaluated as being extra sustainable) and 92 TUs were evaluated to be non-sustainable. Compared to the 2005 survey, there is a greater number of TUs in 2006 evaluated to be sustainable and about the same number of non-sustainable TUs. However, (1) there were fewer responding TUs in the 2006 (160) than in 2005 (186) and (2) a greater number of TUs in 2006 provided data to evaluate their sustainability category than did in 2005. Therefore, the percentage share of sustainable and non-sustainable TUs compared between the 2006 and 2005 surveys is affected by these differences.

Table UA-1. Sustainability Evaluation of Ukrainian Technical Units

Name	Quantity in 2006	%of 2006 Total	Number and % of Total in 2005
Sustainable units	63	39%	46 (25%)
<i>including Extra Sustainable units</i>	7	4%	N/A
Non-sustainable units	92	58%	91 (49%)
Units with unclear status (not enough data for ranking)	5	3%	49 (26%)

Sustainability of Responding Ukrainian TUs, 2006



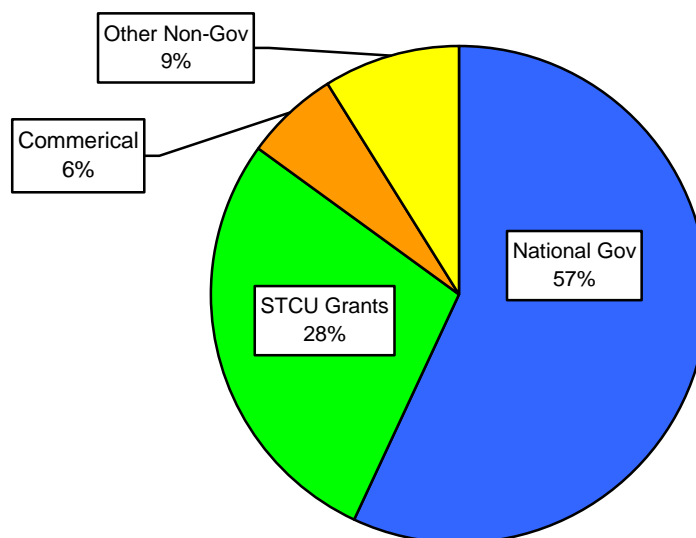
Financing Sources

Government financing holds the largest share of TU funding, with 57%. The share total TU funding coming from STCU is 28%. Of the responding TUs, 37 of them (23%) receive less than 40% of their funding from the government ; 54 TUs (34%) received between 40% to 70% of their financing from the government, and 69 TUs (43%) receive 70%-100% of their funding from the government. Compared to the 2005 data, the share of non-government financing increased about 2% in 2006, with the share held by STCU funding increasing 8%. In 2006, STCU grants represented 65% of the non-governmental funding, which is 7% greater than in the 2005 survey.

Table UA-2. Source of Budgetary Financing for Technical Units

Source of financing	% in 2006	% in 2005
Government	57%	59%
Non-government	43%	41%
• Share from STCU Grants	28%	20%
• Share from Private Commercial Entities	6%	10%
• Share from Other Domestic Non-Gov Organizations (except STCU)	4%	11% (total share of both domestic + foreign non-gov organizations)
• Share from Foreign Non-Gov Organizations (except STCU)	5%	

Sources of 2006 Financing (Ukrainian TUs)



Characteristic of Technical Units

Table UA-3. Quantity of STCU Projects

Quantity of Projects	Number of Responding TUs	% of Total
# of Responding TUs with 1STCU Project	116	73%
# of Responding TUs with 2 Projects	31	19%
# of Responding TUs with 3 Projects	9	6%
# of Responding TUs with 4 Projects	2	1%
# of Responding TUs with 5 Projects	1	0,6%
	159	

Areas of Research Focus

Majority of the responding Ukrainian TUs worked in physics area – 31% (59 TUs), chemistry – 19.5% (31 TUs), material science – 8.2% (13 TUs), radio physics – 6.3% (10 TUs). Also, TUs performed research in astronomy, biology, biophysics, veterinary medicine, geodesy, ecology, electronics, information technologies, radiology, engineering/technology, physiology, nuclear physics and quality of agricultural products.

Collaboration with Foreign Countries

The Ukrainian respondents reported scientific contacts with such countries as the USA, Russia, Poland, Germany, Japan, Italy, Georgia, South Korea, France, Turkey, Great Britain, Netherlands, Austria, Sweden, Canada, Spain, Serbia, Portugal, China, Australia, Greece, Belarus, Norway, Azerbaijan, Lithuania, Belgium, Bulgaria, the Czech Republic, Mexico, Israel, Vietnam, Hungary, Switzerland, and Ireland.

Profile of Technical Unit Scientists

Table UA-4. Average Age of Scientists in Responding Ukrainian TUs

	Average Age (years)
All Researchers	46
Doctors of Science	64
Candidate of Science (PhD)	49

Table UA-5. Proportions of Scientists in Responding Ukrainian TUs, by Age

	%
Under 35 years old	25
Retired	20

STCU Impact on Promoting S&T Excellence

Technology Promotion & Patenting

The Ukrainian respondents reported many technologies suitable for the market (a total 567 technologies), with 23% of these technologies already marketed. About one-half of the reported technologies have patents, 10% are incorporated into business plans, but only 8% of them are supported by marketing research.

Thus, many responding Ukrainian TUs appear to be positioned to introduce their technologies to market, but have little experience in doing so. This can be seen from the small number of technologies supported by marketing programs and the small share of the TU's budget devoted to market promotion and related training (0.5%).

For 7% of the reported technologies, the TUs applied to STCU for help in technology promotion. Of the total quantity of commercialized technologies, 27% received assistance from STCU to be commercialized.

Table UA-6. Technologies Reported by Responding TUs (2006)

Name	Quantity	% of Total
Technologies, total	567	100%
- implemented in market	131	23%
- patented	300	53%
- supported by a business plan	55	10%
- supported by marketing research	42	8%

- applied for STCU technology promotion assistance (e.g., patent support, etc.)	39	7%
- received STCU technology promotion assistance	36	6%
- none of above reported	106	19%

Comment: Total percentage exceeds 100% because respondents could choose multiple categories in the question

Table UA-7. Patenting Reported by Responding TUs

Name	2006			From 2005 Survey		
	Quantity	With STCU assistance		Quantity	With STCU assistance	
Patents Received , total	253	45	17,7%	367	64	17,4%
National (Ukrainian) Patent Applications	240	43	17%	283	58	15,8%
Foreign or International Patents	13	2	0,7%	84	6	1,6%

Level of International Collaboration & Scientific Activity

In 2006, the responding TUs reported less participation in international scientific conferences (525 conferences taking place in Ukraine in 2006 compared to 579 in 2005, and 548 conferences abroad in 2006 versus 557 in 2005). The impact of STCU (as measured by the share of STCU involvement in the total quantity per category) on such international conference participation also reflected this year-on-year decrease—a 6% decrease in conference participation in conferences located in Ukraine and a 3% decrease in participation in conferences abroad. Quantity of joint publications, joint scientific projects, and contracts with business partners generally increased in 2006 versus the 2005 survey. However, the impact of STCU was generally less in these categories in 2006 than in 2005.

Table UA-8. International Collaborative Activities in 2006

Name	2006			2005		
	Quantity	With STCU assistance		Quantity	With STCU assistance	
Participation in International Conferences, Total	1073	346	32%	1136	416	36%
• within the country	525	133	25%	579	182	31%
• Abroad	548	213	39%	557	234	42%
Joint Publications	908	246	27%	642	214	33%
Joint Scientific Projects	267	114	42%	157	78	49%
Contracts with Business Partners, Total	254	64	25%	158	44	28%
• within the country	176	22	12.5%	80	22	27%
• From Abroad	78	42	53%	78	22	28%
Training abroad	103	6	5.8%	84	19	22%

As in the level of international collaborative activities, the quantity of scientific activity showed a general increase in 2006 compared to the 2005 survey results. However, the impact of STCU (as measured by the share of STCU involvement in the total quantity per category) generally decreased between the two surveys.

Table UA-9. Scientific Publications in 2006

Name	2006			2005		
	Quantity	With STCU assistance		Quantity	With STCU assistance	
Monographs, Total	97	12	12%	29	16	55%
• within the country	55	11	20%	23	14	59%
• Abroad	42	1	2%	6	2	33%
Articles	2135	496	23%	654	165	25%
• within the country	1349	278	20.6%	376	90	24%
• Abroad	786	218	27.7%	278	75	26%
Abstracts of the conferences	1625	470	29%	596	196	33%
• within the country	925	201	22%	297	74	25%
• Abroad	700	269	38%	299	122	40%

**Summary Comparison of STCU Impact on Ukrainian Technical Units
(2006 and 2005 Surveys)**

	Quantity (% of Total)	
	Data from 2006	Data from 2005
Technical Units (TUs) to which Questionnaires were sent	216	258
TUs which responded to Questionnaires	160 (74%)	186 (72%)
Source of Financing (budget of TUs)		
National Government	57%	59%
Non-government	43%	41%
- STCU Share of Total Budget (Government + Non-government Financing)	28%	20%
- STCU Share of Non-government Funding Portion	65%	48%
Technical Unit Sustainability Evaluation		
Sustainable units	63 (39%)	46 (25%)
<i>including Extra Sustainable units</i>	7 (4%)	N/A
Non-sustainable units	92 (58%)	91 (49%)
Units with unclear status (not enough data for ranking)	5 (3%)	49 (26%)
Technologies that are Market-Ready	436	215
Areas of STCU Project and Supplemental Activities	TUs using STCU Support	
	Data from 2006	Data from 2005
International Collaboration Supported by STCU		
Participation in International Conferences within Country	133 (25%)	182 (31%)
" " " Conducted Abroad	213 (39%)	234 (42%)
Joint Scientific Articles with Foreign Colleagues	246 (27%)	214 (33%)
Participation in Joint Research Projects (with foreign partners)	114 (42%)	78 (49%)
Contracts with Private Companies within the Country	22 (13%)	22 (27%)
" " " From Abroad	42 (53%)	22 (28%)
Participation in Training Programs Abroad	6 (5.8%)	19 (22%)
Scientific Publishing Activity Supported by STCU		
Scientific Articles within the Country	278 (21%)	90 (24%)
" " Abroad	218 (28%)	75 (26%)
Abstracts Submitted to Conferences within the Country	201 (22%)	74 (25%)
" " " Abroad	269 (38%)	122 (40%)
Patenting Activity Supported by STCU		
National Patents	43 (17%)	58 (15.8%)
Foreign/International Patents	2 (0.7%)	6 (1.6%)

Comment: Data on Ukraine covers two years. Surveys for other STCU Recipient countries were not conducted in 2005.



UZBEKISTAN

Key Findings from Uzbek Technical Units:

1. Questionnaires were sent to 66 Uzbek Technical Units (TUs) that had STCU projects in 2006. Of these, 30 TUs provided responses, for a response rate of 45%. This is a significant response given the uncertain relationship between STCU and the Uzbek government during this time.
2. Of the Uzbek respondents, 5 TUs, (17% of the respondents) were evaluated as sustainable. None of the responding Uzbek TUs were evaluated as extra sustainable.
3. Non-governmental financing formed the most significant share of the responding Uzbek TU funding (61%), with STCU grants holding a 49% share of this total financing. STCU grants were the dominate source of all non-governmental financing for the responding Uzbek TUs, accounting for 80% of such funding.
4. The STCU impact is largest in the area of promoting joint research projects with foreign partners, but weakest in assistance in technology promotion and patenting.
5. The reported average age of scientists in the responding Uzbek TUs is significantly less than in other countries.

Background

Questionnaires were sent to 66 Uzbek Technical Units (TUs) that had STCU projects in 2006. Of these, 30 TUs provided responses, for a response rate of 45%.

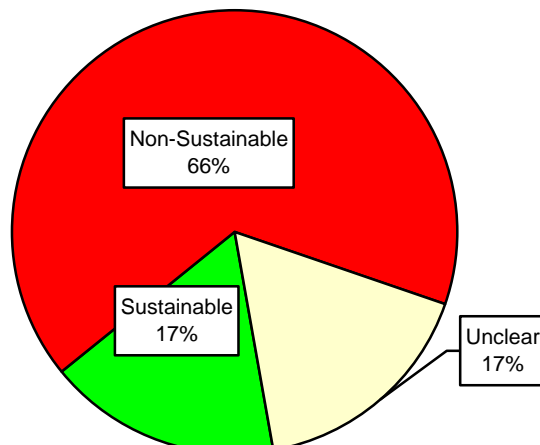
Technical Units Sustainability Evaluation

Using the sustainability criteria described earlier, the responding Uzbek TUs were categorized accordingly, using the data drawn from the TU responses to the questionnaire.

Table UZ-1. Sustainability Evaluation of Uzbek Technical Units

	Quantity	%
Sustainable units	5	17%
<i>including Extra Sustainable units</i>	-	-
Non-sustainable units	20	66%
Units with unclear status (not enough data for ranking)	5	17%

Sustainability of Responding Uzbek TUs, 2006

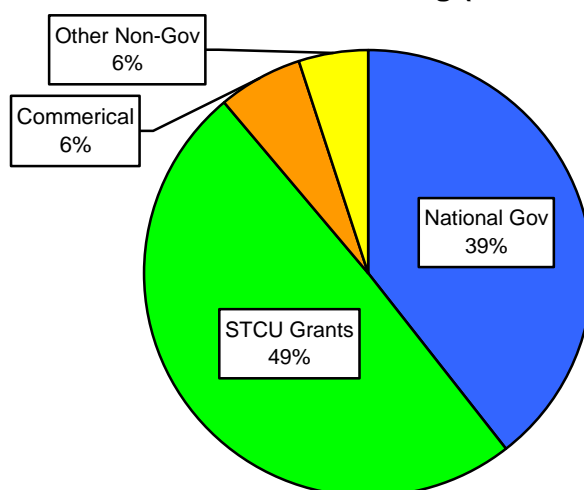


Financing Sources

Table UZ-2. Source of Budgetary Financing for Technical Units

Source of financing	%
National Government	39%
Non-Government	61%
• <i>Share from STCU Grants</i>	49%
• <i>Share from Private Commercial Entities</i>	6%
• <i>Share from Other Domestic Non-Gov Organizations (except STCU)</i>	5%
• <i>Share from Foreign Non-Gov Organizations (except STCU)</i>	1%

Sources of 2006 Financing (Uzbek TUs)



Characteristic of Technical Units

Table UZ-3. Quantity of STCU Projects

	Number of Responding TUs	% of Responding TUs
# of Responding TUs with 1STCU Project	23	77%
# of Responding TUs with 2 Projects	6	20%
# of Responding TUs with 3 Projects	-	-
# of Responding TUs with 4 Projects	1	3%

Areas of Research Focus

The majority of responding Uzbek TUs performed research in nuclear physics (30%) and microbiology (13%). Other major research directions include general physics, biology, general chemistry, and applied sciences.

Collaboration with Foreign Countries

The majority of responding Ukrainian TUs reported scientific contacts with the USA, followed by Russia, Ukraine, and Kazakhstan, and much less often with colleagues from France, Germany, and others.

Profile of Technical Unit Scientists

The average age of Uzbek scientists in the responding TUs is 42 years, younger than in other surveyed countries.

Table UZ-4. Average Age of Scientists in Responding Uzbek TUs

	Average Age (years)
All Researchers	42
Doctors of science	50
Candidate of Science (PhD)	45

Table UZ-5. Proportions of Scientists in Responding Uzbek TUs, by Age

	%
Under 35 years old	24%
Retired	16%

STCU Impact on Promoting S&T Excellence

Technology Promotion & Patenting

The responding Uzbek TUs reported 46 technologies as ready for the market. Two of the responding TUs have applied to STCU for assistance in technology promotion and got help from STCU. There were 20 patent applications and 19 patents, received by TUs from Uzbekistan in 2006. None of them is got with STCU assistance.

Table UZ-6. Technologies Reported by Responding TUs (2006)

	Quantity	% of Total
Technologies, total	46	100%
- implemented in market	10	22%
- patented	22	47%
- supported by a business plan	6	13%
- supported by marketing research	3	7%
- applied for STCU technology promotion assistance (e.g., patent support, etc.)	3	7%
- received STCU technology promotion assistance	3	7%

* Total percentage exceeds 100% because respondents could choose multiple categories in the question

Table UZ-7. Patenting Reported by Responding TUs (2006)

Name	Quantity	With STCU assistance	
Patents received in 2006, total	19	-	-
National (Uzbek) Patent Applications	20	-	-
Foreign or International Patents Applications	-	-	-

Level of International Collaboration & Scientific Publication

Participation in international conferences, joint publications with foreign colleagues, and individual scientific articles and abstracts published in foreign forums are the most popular types of interaction by the responding Uzbek TUs, and in these interactions, STCU impact is very strong.

Table UZ-8. International Collaborative Activities in 2006

Name	Quantity	With STCU assistance	
Participation in International Conferences, Total	126	18	14%
• within the country	69	4	6%
• Abroad	57	14	24%
Joint Publications	133	44	33%
Joint Scientific Projects	29	17	59%
Contracts with Business Partners, Total	21	2	9%
• within the country	10	1	10%
• From Abroad	11	1	9%
Training abroad	8	2	25%

Table UZ-9. Scientific Publications in 2006

Name	Quantity	With STCU assistance	
Monographs, total	5	-	-
• within the country	3	-	-
• Abroad	2	-	-
Articles	160	51	32%
• within the country	66	10	15%
• Abroad	94	41	44%
Abstracts of the conferences	186	58	31%
• within the country	104	15	14%
• Abroad	82	43	52%

Summary of STCU Impact on Responding Uzbek Technical Units

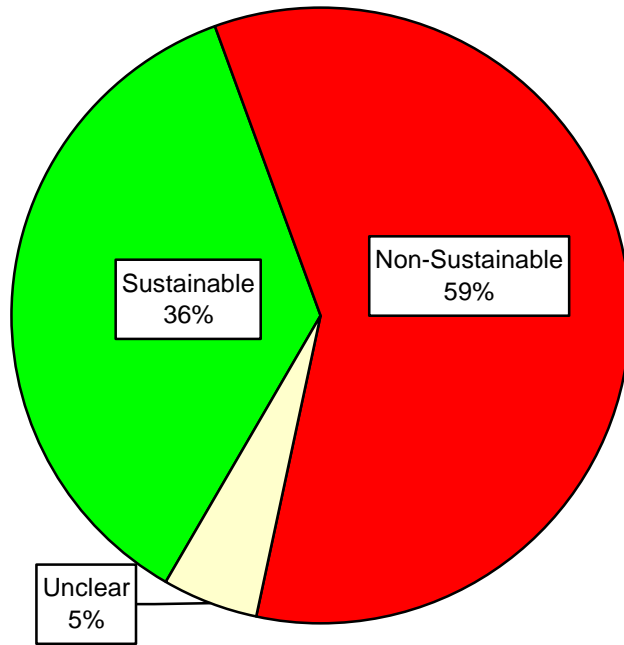
	Quantity (or %)
Technical Units (TUs) to which Questionnaires were sent	66
TUs which responded to Questionnaires	30 (45%)
Source of financing (budget of TUs)	
National Government	39%
Non-government	61%
- STCU Share of Total Budget (Government + Non-government Financing)	49%
- STCU Share of Non-government Funding Portion	80%
Technical Unit Sustainability Evaluation	
Sustainable units	5 (17%)
<i>including</i> Extra Sustainable units	-
Non-sustainable units	20 (66%)
Units with unclear status (not enough data for ranking)	5 (17%)
Technologies that are Market-Ready	36
Areas of STCU Project and Supplemental Activities	TUs using STCU Support
International Collaboration Supported by STCU	
Participation in International Conferences within Country	4(6%)
" " " Conducted Abroad	14(24%)
Joint Scientific Articles with Foreign Colleagues	44(33%)
Participation in Joint Research Projects (with foreign partners)	17(59%)
Contracts with Private Companies within the Country	1 (10%)
" " " From Abroad	1 (9%)
Participation in Training Programs Abroad	2(25%)
Scientific Publishing Activity Supported by STCU	
Scientific Articles within the Country	10(15%)
" " Abroad	41 (44%)
Abstracts Submitted to Conferences within the Country	15 (14%)
" " " Abroad	43(52%)
Patenting Activity Supported by STCU	
National Patents	-
Foreign/International Patents	-



Summary of STCU Impact on Responding Technical Units, by Country and in Total (2006)

	AZ	GE	UA	UZ	Total
Technical Units (TUs) to which Questionnaires were sent	10	23	216	66	315
TUs which responded to Questionnaires	9 (90%)	19 (80%)	160 (74%)	30 (45%)	218 (70%)
Source of financing (budget of TUs)					
National Government	58%	39%	57%	39%	48%
Non-government	42%	61%	43%	61%	52%
- STCU Share of Total Budget (Government + Non-government Financing)	21%	47%	28%	49%	36%
- STCU Share of Non-government Funding Portion	50%	77%	65%	80%	58%
Technical Unit Sustainability Evaluation					
Sustainable units	3 (33%)	7 (37%)	63 (39%)	5 (17%)	78 (36%)
<i>including Extra Sustainable units</i>	1 (11%)	1 (5%)	7 (4%)	-	9 (4%)
Non-sustainable units	6 (67%)	11 (58%)	92 (58%)	20 (66%)	129(59%)
Units with unclear status (not enough data for ranking)	-	1 (5%)	5 (3%)	5 (17%)	11 (5%)
Technologies that are Market-Ready	33	26	436	36	531
Areas of STCU Project and Supplemental Activities	TUs using STCU Support				
International Collaboration Supported by STCU					
Participation in International Conferences within Country	7 (9%)	3(20%)	133 (25%)	4(6%)	147 (21%)
" " " Conducted	6 (7%)	17(30%)	213 (39%)	14(24%)	250 (33%)
Joint Scientific Articles with Foreign Colleagues	5 (3%)	23(21%)	246 (27%)	44(33%)	318 (24%)
Participation in Joint Research Projects (with foreign	10 (33%)	5(18%)	114 (42%)	17(59%)	146 (41%)
Contracts with Private Companies within the Country	1 (6%)	-	22 (13%)	1 (10%)	24 (11%)
" " " From Abroad	2 (50%)	2(50%)	42 (53%)	1 (9%)	47 (48%)
Participation in Training Programs Abroad	-	3(19%)	6 (5,8%)	2(25%)	11 (8%)
Scientific Publishing Activity Supported by STCU					
Scientific Articles within the Country	6(3%)	19 (30%)	278 (21%)	10(15%)	313 (19%)
" " Abroad	4(8%)	16 (19%)	218 (28%)	41 (44%)	279 (27%)
Abstracts Submitted to Conferences within the Country	7(12%)	3 (25%)	201 (22%)	15 (14%)	226 (20.5%)
" " " Abroad	17(25%)	10(22%)	269 (38%)	43(52%)	339 (38%)
Patenting Activity Supported by STCU					
National Patents	-	8 (72%)	43 (17%)	-	51 (17,7%)
Foreign/International Patents	-	-	2 (0.7%)	-	2 (0.6%)

Sustainability of Responding TUs, 2006



Sources of 2006 Financing For All Responding TUs

