Science and Technology Center in Ukraine (STCU)

Commercializing STCU Projects – Perspectives for Technology Transfer

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Kyiv, Ukraine

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STCU Mission

- **Nonproliferation**: Prevent the spread of WMD expertise by supporting civilian R&D activities of Azeri, Georgian, Moldovan, Ukrainian and Uzbek scientists and engineers formerly involved WMD and their means of delivery.

- **Sustainable Redirection**: Create opportunities for former WMD scientists and engineers to develop sustainable civilian research work that contributes to the economic development of their countries, finds solutions to national/international S&T problems, and builds successful research groups.

10 years of international cooperation

STCU Membership Includes Five Countries

Over 1,000 Scientific and Technical Institutes.

Approximately **20,000** Former Weapons Scientists.

Financing & Recipient Parties

Canada

Commercial Partners

E.U.

Government Partners

U.S.A.

Science & Technology Center in Ukraine

Azerbaijan

Georgia

Moldova

Ukraine

Uzbekistan

Making Progress, Seeing Results

- Over 900 Projects ($140 million) since 1995
- Over 120 Partner Organizations (over $34 million in projects)
- **Over 200 Patent Applications of STCU Project Results**
- Several Targeted Initiatives Addressing Issues of National/International Concern
  - Land Mine Destruction Technology Evaluation Project
  - Y2K Remediation Program
  - **Jointly Financed Targeted Projects** with Ukrainian Agencies
  - Sustainability/Commercialization Training

Financing of Projects Through Targeted R&D Initiatives – New Form of Cooperation of STCU with Ukraine

- **Approved by 20th STCU Governing Board**
  - Co-financing of ***Selected Regular Projects*** by Recipient Party Government and STCU
- **First TRDI: STCU and Ukraine (NASU)**
  - Protocol between STCU and National Academy of Sciences of Ukraine
- **Similar Initiatives Under Discussion (Georgia, Ukrainian Ministry of Environmental Protection, Ukrainian Academy of Agrarian Sciences)**

STCU-NASU Cooperation Agreement Signing Ceremony – Kyiv, 26 May 2005

TRDI Creates Equal Partnership, Vested Interest, and Leveraged Funding by Recipient Party

Government Programs Make Use of STCU

Over 20 Government Partners including:

- Max Planck Institute of Plasmaphysics
- UK Department of Trade and Industry
- U.S. Department of Energy/Initiatives for Proliferation Prevention (IPP)
- U.S. Department of Energy/Office of Global Threat Reduction
- U.S. National Institutes of Health/National Cancer Institute
- USAF European Office of Aerospace Research and Development
- U.S. Department of Agriculture/Agricultural Research Service
- U.S. Department of Defense/Defense Threat Reduction Agency

Over 130 Projects = Over $20 Million USD and 980,000 Euros

Non-Government Partners: Critical to Self-Sustainability

Over 120 Non-Government Partners including:

- K+S Electron Technologies (California, USA)
- 3M Corporation (Delaware, USA)
- DuPont (Minnesota, USA)
- PPG Industries, Inc (Pittsburg, USA)
- Boeing (Seattle, USA)
- Intel Corp. (USA)
- AECL Chalk River Laboratories (Ontario, Canada)
- Medteknostics, Inc. (Calgary, Canada)
- Airbus (UK)
- Atofina (Paris, France)
- Michelin (Clermont-Ferrand, France)

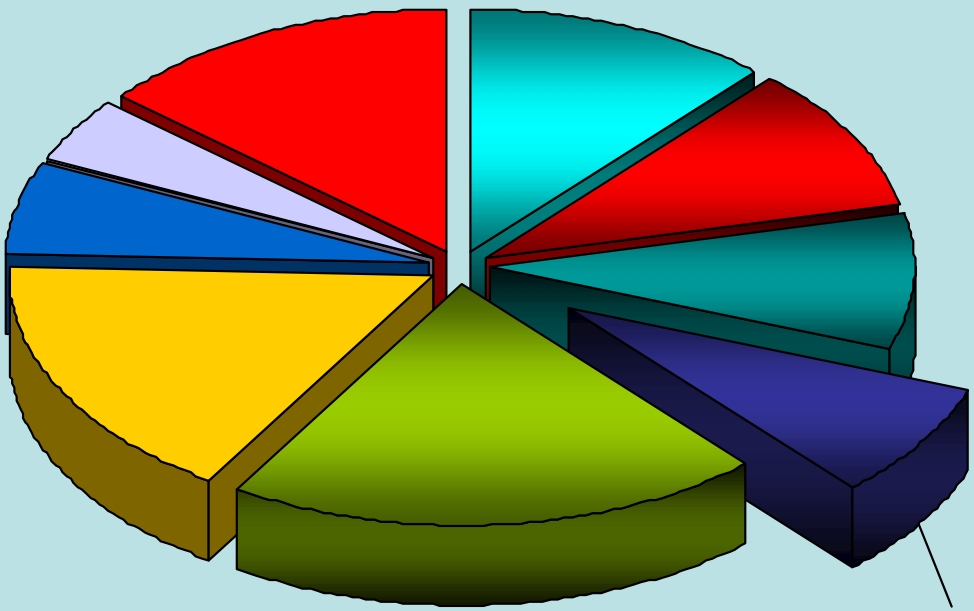
Over 115 Projects = $14 Million USD and 580,000 Euros

STCU Support Activities

- Projects: Cooperative research
- Patent Support
- Travel Grants
- Support for workshops and conferences
- Training
- Matchmaking services for Partners
- Business missions and trade shows

STCU Contribution to Aerospace Sector

STCU Parties Contributed over US$9 million and 226,060 Euros to 80 Projects in the Aerospace, engaging Over 1500 scientists



Aerospace Sector

Aerospace Technologies:

- Composite Materials, Alloys & Metals
- Hardware/Software
- Automation & Robotics
- Sensors
- Electronics and Optics
- Power and Energy Devices

Cooperation STCU-NSAU

- On February 16, 2006 Yuriy Alexeev, the Director General of National Space Agency of Ukraine, visited STCU and met Executive Director Andrew Hood and other STCU staff.

•STCU co-sponsored the United Nations/Ukraine Workshop on Space Law "Status, Application and Progressive Development of International and National Space Law".

•STCU sponsored the International Workshop "Advanced Airspace Materials" (June 29-July 1, 2005 in Kyiv, Ukraine).

•STCU sponsored "From Science to Business" Workshop (11-12 October, 2006 in Kyiv, Ukraine).

STCU Aerospace Sector Partners

- Pivdenne / Yuzhnoye State Design Office.
- Makarov Pivdenny Machine Building Plant Industrial Association State Enterprise.
- Main Astronomical Observatory of the NASU
- Space Research Institute of NASU and NSAU.
- Lviv Center of the Institute of Space Research under NAS and NSA of Ukraine.
- Khartron JSC.
- National Aerospace University “Kharkiv Aviation Institute”.
- Pavlograd Chemical Plant.
- Pavlograd Mechanical Plant.
- Proton Research and Design Center.
- Centre for Aerospace Research of the Earth (CASRE).
- Ivchenko Zaporozhye Machine-Building Design Bureau “Progress”

International Space Station Cooperation NASA – NSAU – STCU

- **Implementation of Specific Ground-Based Research Projects**
  - Initiated in November 22, 1997 under the Agreement between the United States and Ukraine on Cooperation in the Exploration and Use of Outer Space for Peaceful Purposes
  - National Aeronautics and Space Administration (NASA) of the USA, National Space Agency of Ukraine (NSAU) and STCU implemented 40 specific ground-based research projects in the area of life sciences

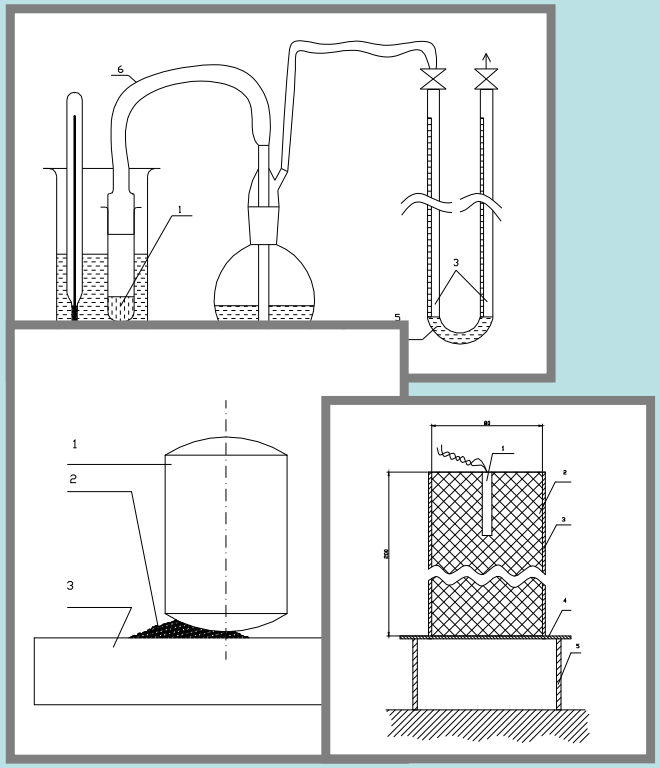
40 Ground-Based Projects in Life Sciences have been financed through STCU, over $3 million.

Development of Combined Telescope for Measurements of High Energy Charge Particle Fluxes

- Projects Organized by STCU, Funded by USA
  - Two Participating Organizations:
  - Kharkiv National University and Polinom & K
- Project Goal was Development of Advanced Satellite Devices for Measurement of Charge Energy Particle Fluxes
  - **Successfully Implemented**
- Kharkiv National University Received Funding from NSAU for Development of Satellite Telescope STEP-F for the Installation on Board of Russian Space Science Mission “Coronas-Photon”
  - **Planned for space flight**

Technology for Processing Perchlorate Rocket Propellants in Civil Explosives

- Projects Organized by STCU, Funded by USA and Canada.
- Two Participating Organizations (Pavlograd Chemical Plant and Research and Design Center "Proton")
- To study the properties of solid perchlorate propellants together with the development of a technology for its transformation and production of emulsified explosives for mining.
- The project resulted in creating opportunity of the solid perchlorate propellants usage as a source material for cheaper civil explosives.



– **Project was Successfully Implemented.**

Solid Fuel Propellant Utilization

Problem:

- In 2003 U.S. DTRA pilot project on SS-24 missiles solid fuel elimination was started, but after 6 months of pilot plant phase of testing it was cancelled because of disagreement between the US and Ukrainian officials.
- The solid rocket fuel is old and deteriorating. The problem of its utilization is extremely important.
- Pavlograd is storage location with risk for surrounding population.

Aims of the project/proposal

- Assessment of quantity and quality of the ammunition of Ukrainian Ministry of Defense which contains solid propellants.
- Threat analysis of the impact of undesired reactions/use of ammunition containing solid propellants.
- Destruction – recycling methods.

Ukraine Needs This Project

STCU activity with SDB Yuzhnoye

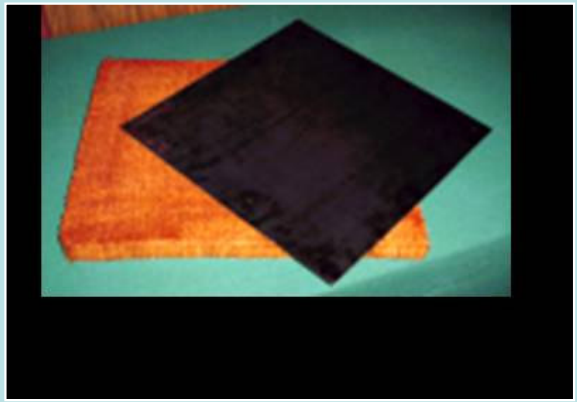
STCU Governments Contributed over US$3.9 Million and 616,000 Euros in 55 Projects with SDB Yuzhnoe

- Projects Engaged a total of 837 Scientists and Engineers

<u>Significant STCU-Yuzhnoye Projects</u>:

- Development of a Plasma Surgical Complex

- Development of New Advanced Honeycomb Designs for Conversion Purposes



Technology Transfer Center Establishment with NSAU

On February 2006 STCU and NSAU initiated a project to form TTC establishment

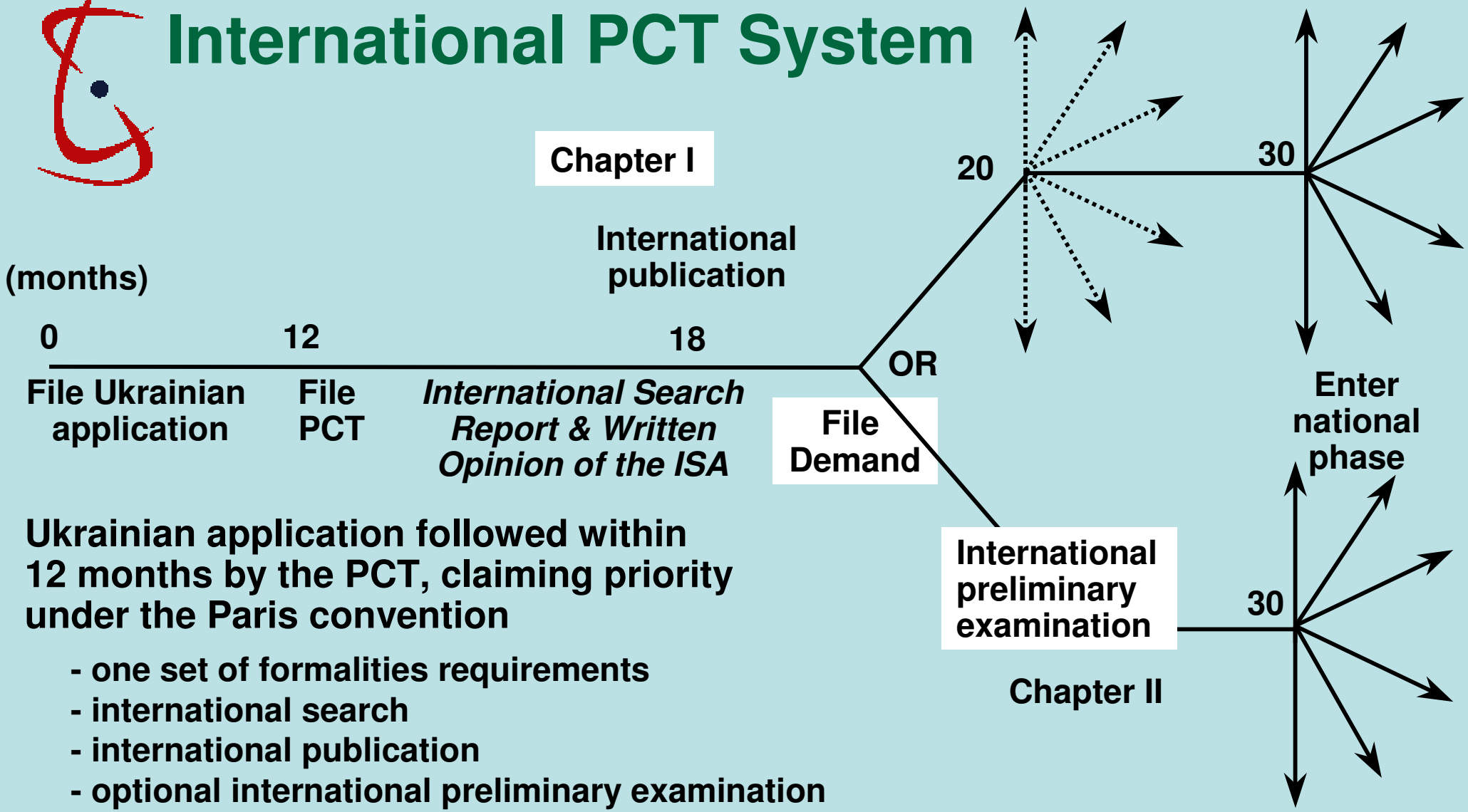
Goals:

- Technology transfer methodology/Pilot project of technology transfer
- Technology database development
- Operational center set-up

Benefits :

- Opening of new markets & new sources of income
- Patenting and Licensing
- Business Development & Jobs creation
- Diversification
- Creating interests for investor and New global partnerships.

International PCT System



Ukrainian application followed within 12 months by the PCT, claiming priority under the Paris convention

- one set of formalities requirements
- international search
- international publication
- optional international preliminary examination
- translations and national fees required at 20 or 30 months, and only if applicant wants to proceed with national phase entry.

* (*Obtained from Judson Hightower and Mark Powell, US)*

STCU Patent Support

Criteria

- Technical Merits
- Commercialization Potential

Technical Merits

- New and Unique
- Non-Obvious
- No Prior Art
- Useful

Commercialization Potential for <u>Evolutionary</u> Improvement (50% better)

- Has Good Licensing Potential
- Company or Companies Identified for Licensing
- Market is Large (Profit Potential is Large)
- Many Competitors or Few Competitors
- Competitors Identified
- Technology Comparison with International Competitors (How much Better)
- Stage of Technology Development

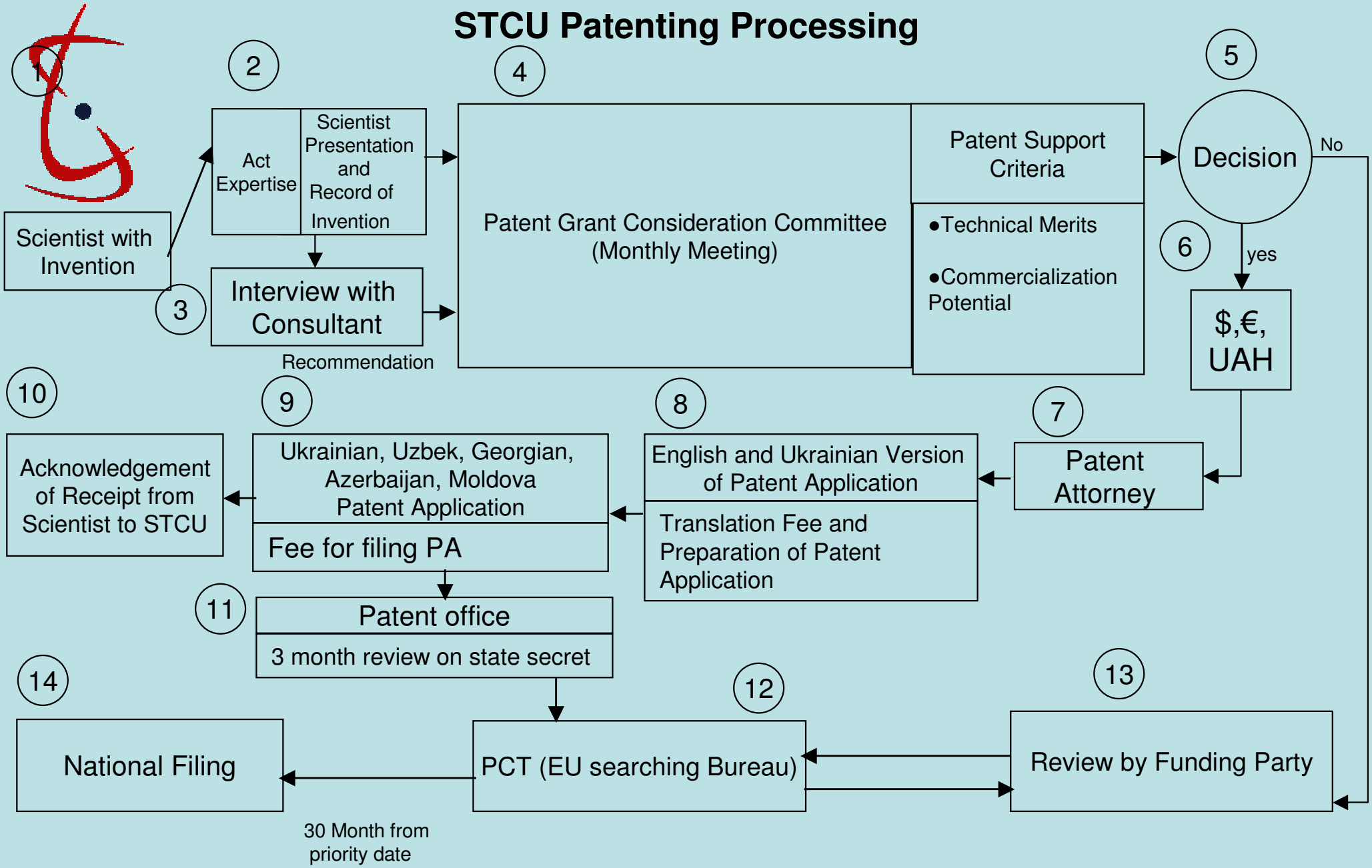
Commercialization Potential for <u>Revolutionary</u> Development (10-100 times better)

- Has Good Start-up Potential
- Company Formed
- Company Partner Identified
- Serious Discussions On-going with Company
- Joint Venture Possible
- Investor or Investors Identified
- Presentations Made to Investors

Competitive Matrix – A Patenting and Licensing Tool

Important product or technology characteristics	My company or institute's product	Name of Competitor #1	Name of Competitor #2, etc.
Key Characteristic (a)			
Key Characteristic (b)			
Key Characteristic (c)			
Key Characteristic (d) (usually cost)			

STCU Patenting Processing



Licensing

Benefits

- Regular royalties through sales of product,
- Forming long-term partner relationships,
- Fewer financial and organizational risks with licensing,
- Much less work, and Science continues in laboratory.

Disadvantages

- Patenting costs are high, especially international patenting.
- In general, revenues from licensing are determinedly smaller than through start-up companies (if they are successful).
- Necessary care in selecting licensing partner and fashioning the joint licensing agreement to protect your own interests.

Licensing Success in the Marketplace

Success depends on many factors:

- Licensed technology must be highly competitive with better quality and lower price
- Licensed technology must be at a stage of development which is fully tested and ready for production and sale.
- Market infrastructure must be in place and ready to accept the new technology.
- The inventor has to include his own know-how when he transfers his technology for production and sale.
- It is necessary to structure licensing agreement so that governments cannot legally give your technology to your competitors (for example in other countries).

STCU Summary

- **Financial Support of Projects**
- **Financial Support in International Patenting, Licensing from STCU Projects**
- **International Trade-show Delegations and Booths for Matchmaking**
- **Targeted Initiatives – New Form of Country and Agency Cooperation**
- **Support for Technical Transfer Center**
- **Information Support**
- **Travel Grants to Meet International Companies**
- **STCU Advertising through STCU TPF's (Technology Profile Forms)**

STCU Contact Information

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