



National Natural Science Foundation of China
(NSFC)

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What is National Natural Science Foundation of China (NSFC)?

- NSFC is affiliated to the State Council, an institution for the management of the National Natural Science Fund, established on Feb. 14, 1986.
- **Mission:** *funding basic research and applied basic research, identifying and fostering scientific talents, promoting science and technology.*
- **Objectives:** "one formation and three promotions".
 - *to form* a more dynamic, more efficient, and more open science funding system with Chinese characteristics;
 - *to promote* balanced, coordinated and sustainable development of scientific disciplines and enable several mainstream disciplines to enter the frontiers of world science;
 - *to promote* construction of high level research teams, and foster a number of outstanding scientists and creative teams with international influence;
 - *to promote* the overall development of basic research in China and significantly enhance the international impact of basic research and capability of independent innovation in several major scientific areas.
- **Strategic guidance:** *put more emphasis on basic research, frontier research and talented personnel in the whole procedure of the evaluation, funding and management of the fund.*



Overall Funding Structure

➤ *Three lines: research program, talent program and environmental condition program*

➤ *The research program*

mainly focuses on making unified disciplinary layout, highlighting priority fields, promoting disciplinary crossing and encouraging original innovation. Comprises *General Program, Key Program, Major Program, Major Research Plan* and *International (regional) Collaborative Research projects*.

➤ *The talent program*

mainly focuses on building personnel reserves, stabilizing young personnel, supporting regional personnel, cultivating top-rate personnel and building innovation teams. Comprises *Fund for Talent Training in Basic Science, Young Scientists Fund, Fund for Less Developed Regions, Fund for Distinguished Young Scholars, Fund for Creative Research Groups* and *Research Fellowships for International Young Scientists*.

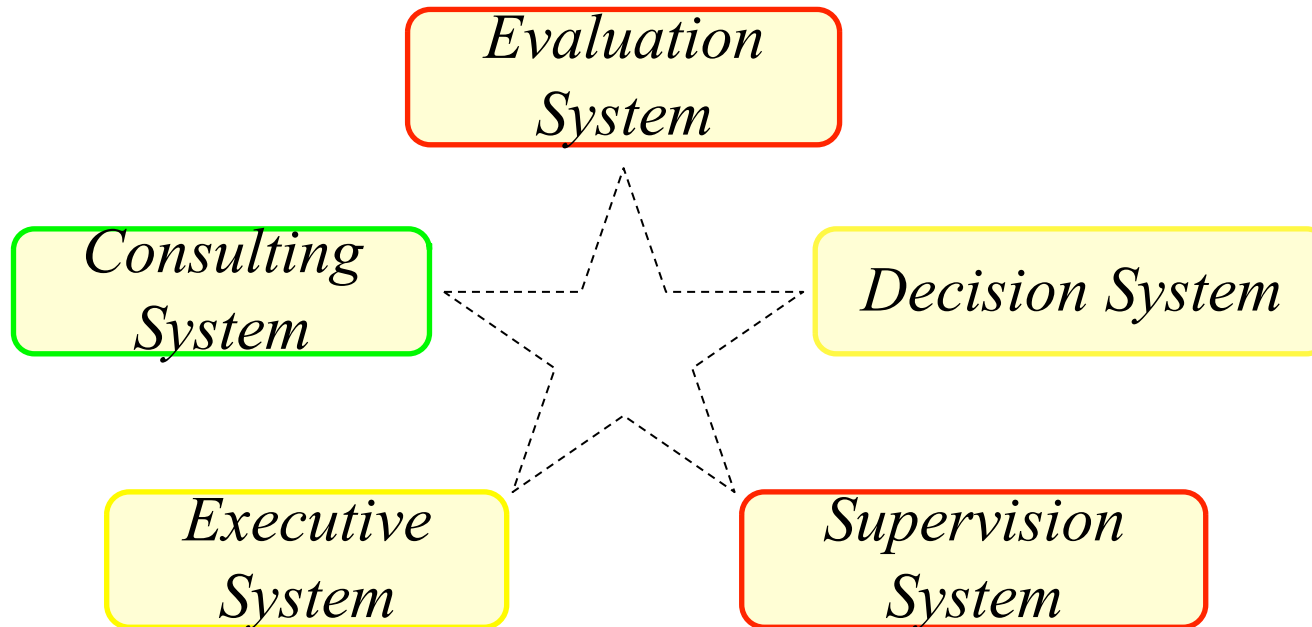
➤ *The environmental condition program*

mainly focuses on strengthening condition support, promoting resource sharing, promoting public understanding, and optimizing development environment. Comprises *the Special Fund for Basic Research on Scientific Instruments, the Programs of Joint Funds, the Special Fund for Scientific Activities for Teenagers, and the Program for International (regional) Academic Conference and Exchanges*.



NSFC Operation

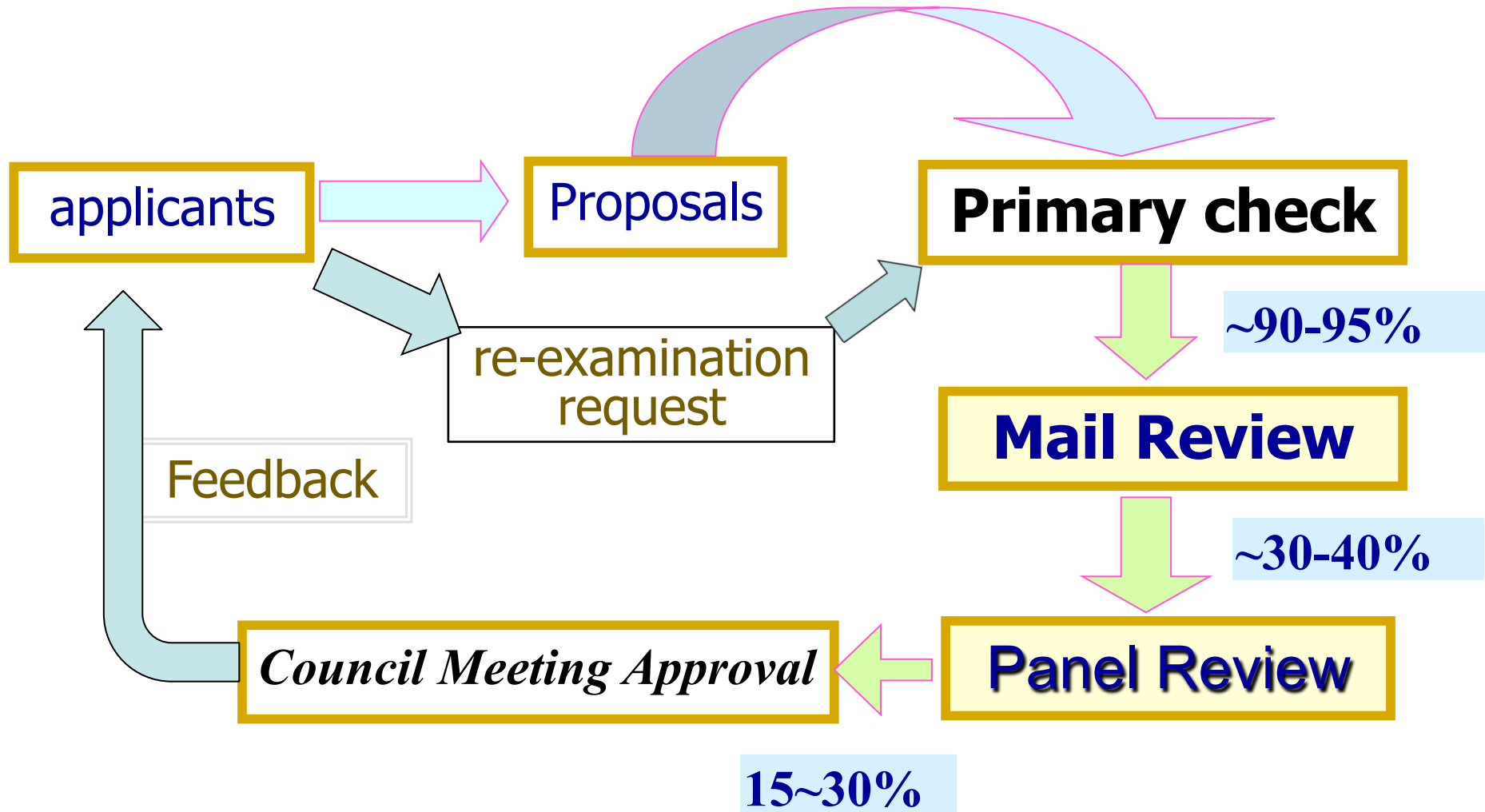
- The main funding agency to support basic researches in China
- Bottom-up proposals, evaluated based on external peer review
- High reputation---fair competition and excellent operational system



Integrated functional system in NSFC by external experts and internal staff



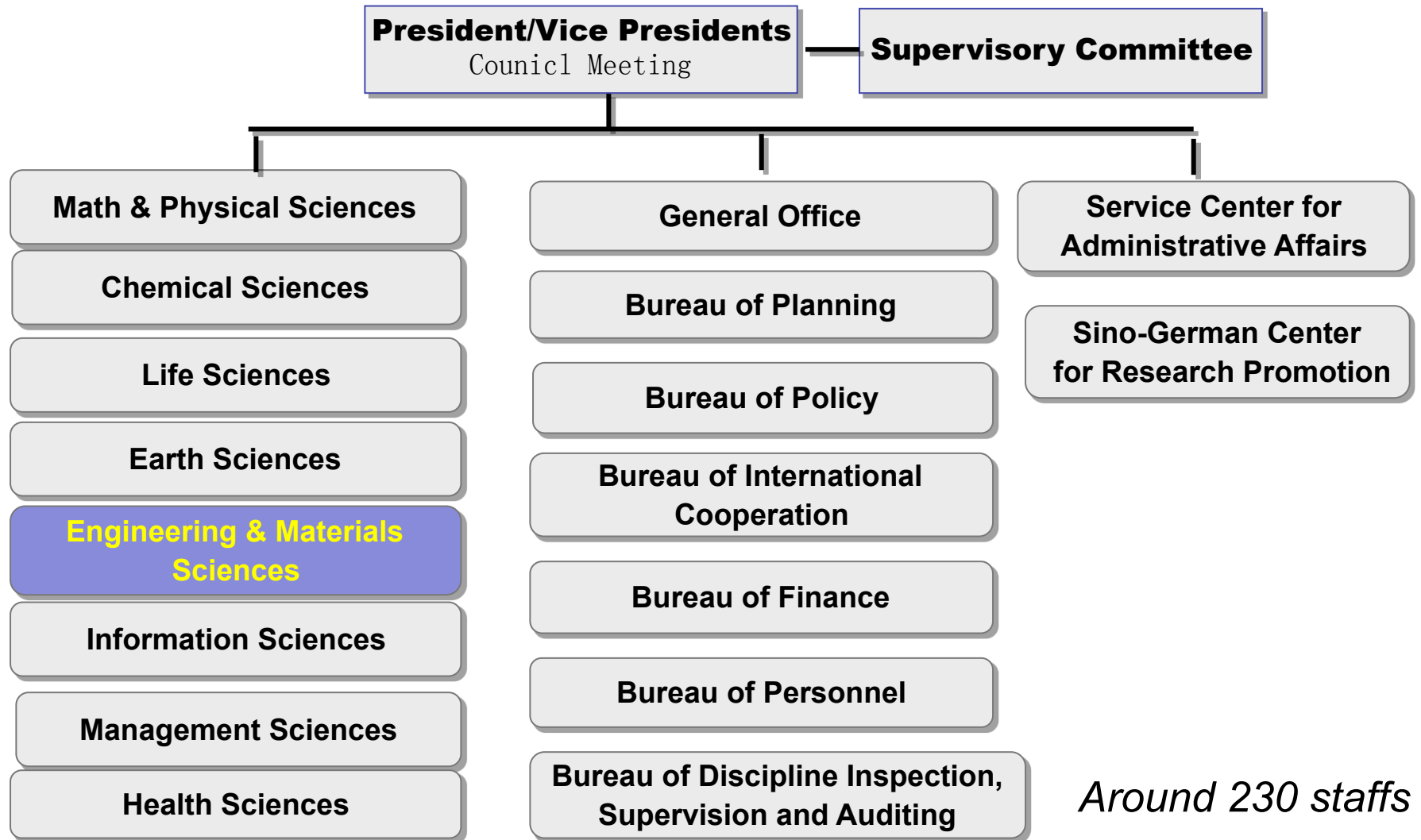
Typical Procedure of Peer Review



Rely on experts and the peer review system to support the best in a fair way



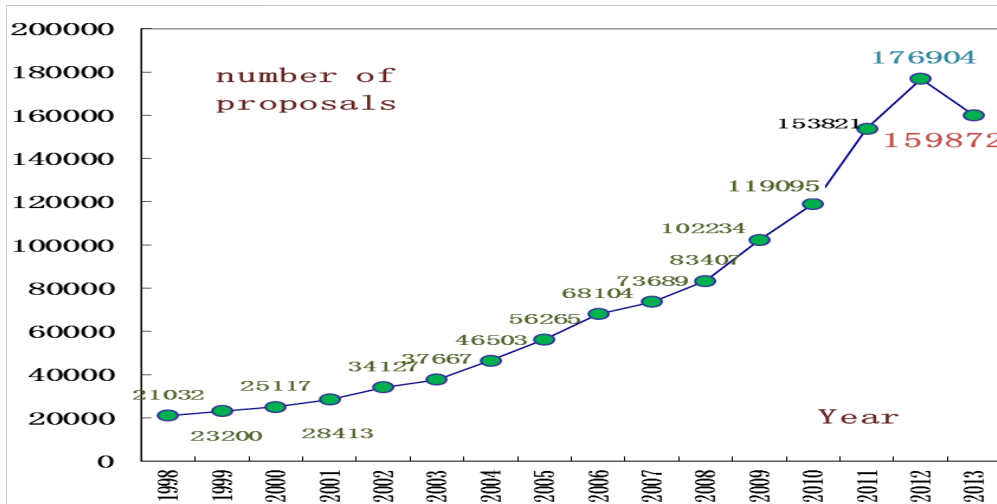
NSFC Organization Chart



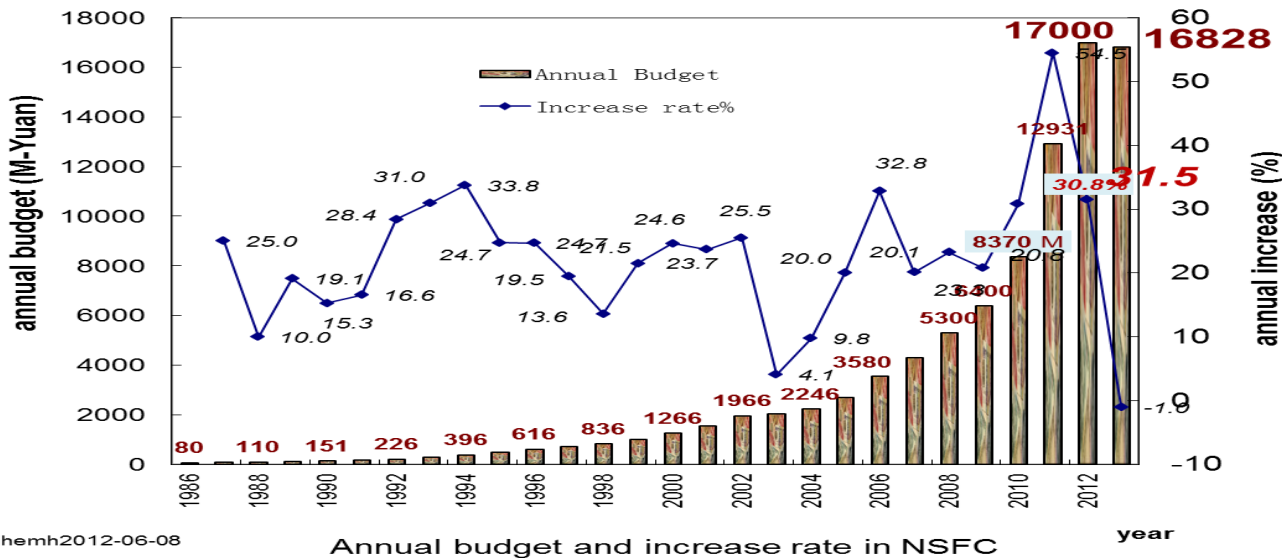
Around 230 staffs



Proposals, Funding and Annual Budget



In 2013, a new policy to cut down proposals is introduced:
stop 1 year after 2 year's failure



Budget for 2013 from the central government:
16.828 billion RMB

The granting in 2013:
23.82 billion RMB

*The funding does not include salaries



Department of Engineering and Materials Sciences

- *We are the 2nd largest department within NSFC. Usually the funds for projects approved each year is around 17% of total funds of NSFC. For 2013, total funds for approved projects is about 4.1 billion RMB (23.8 billion for NSFC)*
- *We also work with industry such as steel, coal, railway transportation to set up joint funds to promote the integration of knowledge innovation and technological innovation, to speed up the research and development of new technologies for industry.*
- *Divided into 9 disciplinary:*
 - *E01-----Metallic materials*
 - *E02----- Inorganic nonmetallic materials*
 - *E03----- Organic polymer materials*
 - *E04----- Metallurgical science and engineering, mining science and engineering*
 - *E05----- Mechanical science and manufacturing science*
 - *E06----- Engineering thermo-physics and utilization of energy sources and engineering*
 - *E07----- Electrical science and engineering*
 - *E08----- Architecture, civil engineering and environmental engineering science*
 - *E09----- Hydraulic science and oceanic engineering*



Division of Electrical Science and Engineering

Covers: electric (magnetic) energy science, the interaction between electromagnetic fields and materials.

The related research fields include (not least):

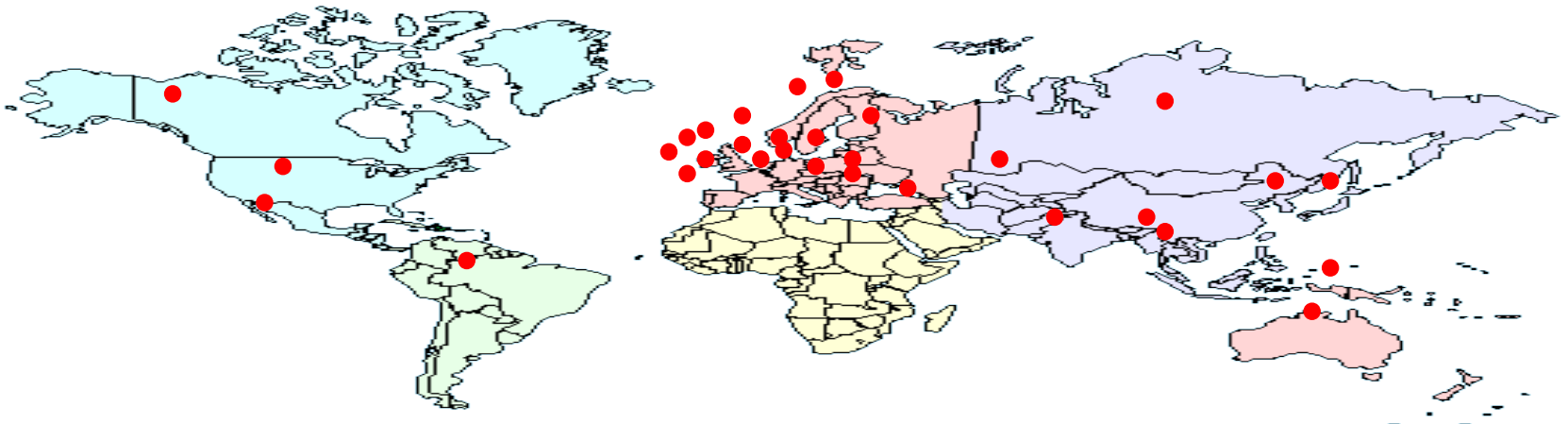
- ◆ *electric network theory, electromagnetic field theory, electromagnetic measurement technology*
- ◆ *engineering dielectrics*
- ◆ *electric machine and its control, electric drive and motion control*
- ◆ *power system and its automation*
- ◆ *power electronics*
- ◆ *high voltage and electrical insulation technology*
- ◆ *pulse power technology*
- ◆ *discharge and plasma technology*
- ◆ *superconducting technology*
- ◆ *electromagnetic biological technology*
- ◆ *environmental electro-technology and electromagnetic compatibility*
- ◆ *renewable energy system related to electrical engineering*

2013: 439 grants, about 291.5 Million RMB



International Cooperation

- **69 Cooperative Agreements or MoUs with Institutions in 35 Countries and Regions**
- **Categories of International Cooperation Projects**
 - ✓ *Projects funded by NSFC and its Partners organizations under agreements or MoUs (joint research, workshops, exchange of researchers, etc)*
 - ✓ *Major International Joint Research Projects (single-side fund)*
 - ✓ *Research fellowship for international young scientists*
 - ✓ *Sino-German Center for Research Promotion*

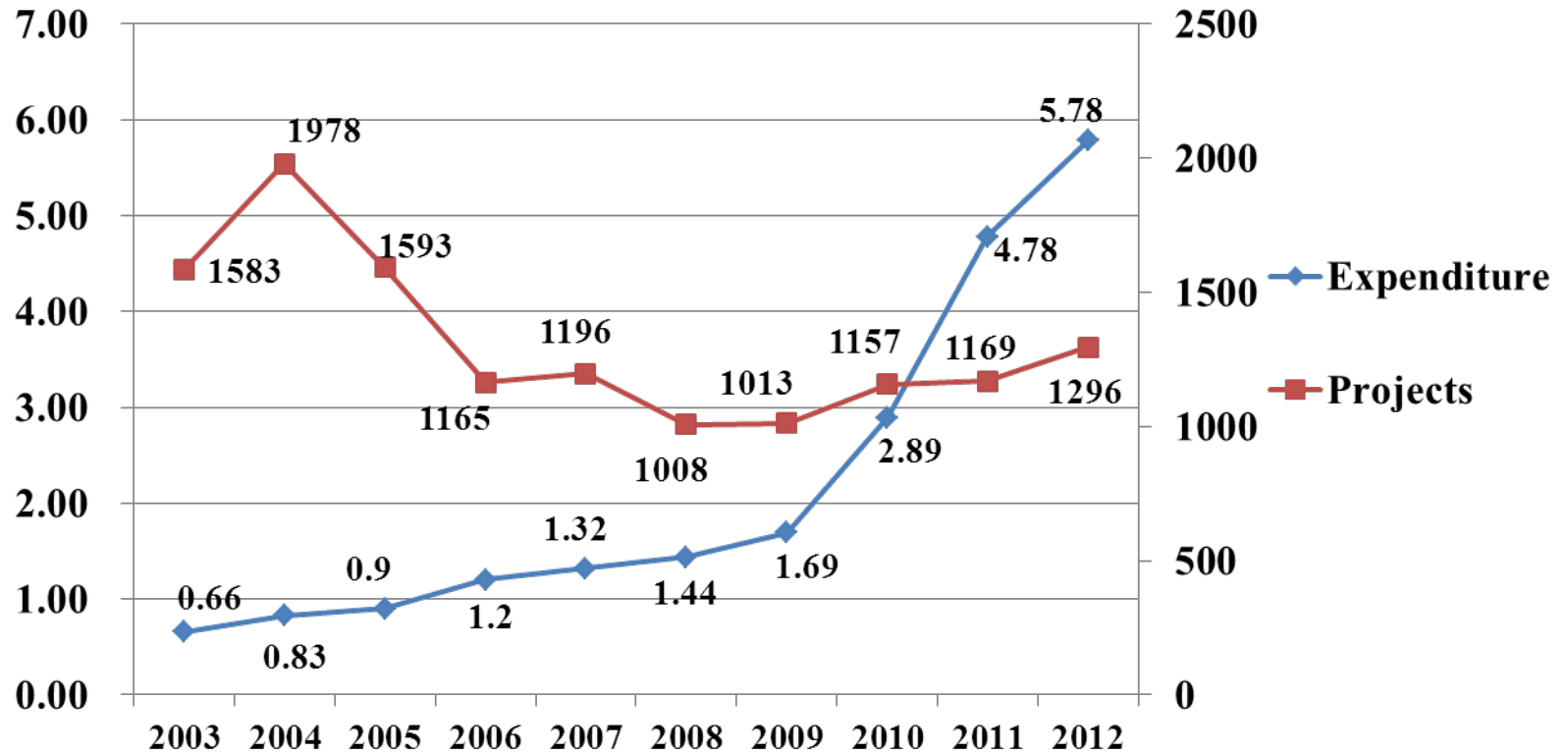




Expenditure and Funded Projects

Expenditure (100 million)

Funded projects



*Increase a lot in recently years!
Mainly for joint research.*

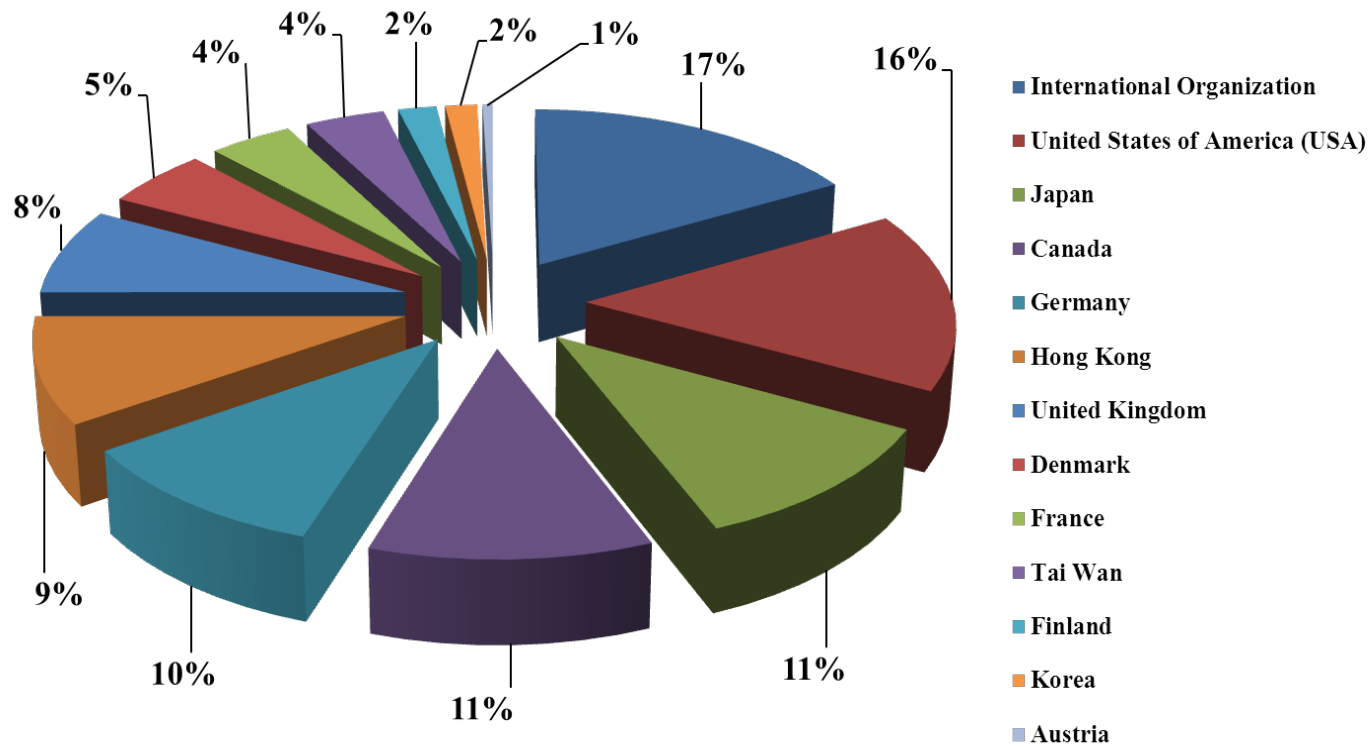


Joint Research Projects

- ◆ *Every year, more than 20 rounds of bilateral or multilateral call for proposals are launched in different scientific fields*
- ◆ *Joining Funding Mechanism*
 1. *Themes or fields of common interest jointly agreed*
 2. *Joint call with joint application forms*
 3. *Joint, separate or international evaluation*
 4. *Joint decision-making for funding (joint panel meeting)*
- ◆ *Main Evaluation Criteria*
 1. *Scientific quality and innovativeness of the joint research plan*
 2. *Added value to be expected from research collaboration*
 3. *Degree of complementarity between the involved research teams*
 4. *Feasibility of the joint research plan*
 5. *Competence and expertise of research teams*
 6. *Promotion of young scientists' careers*



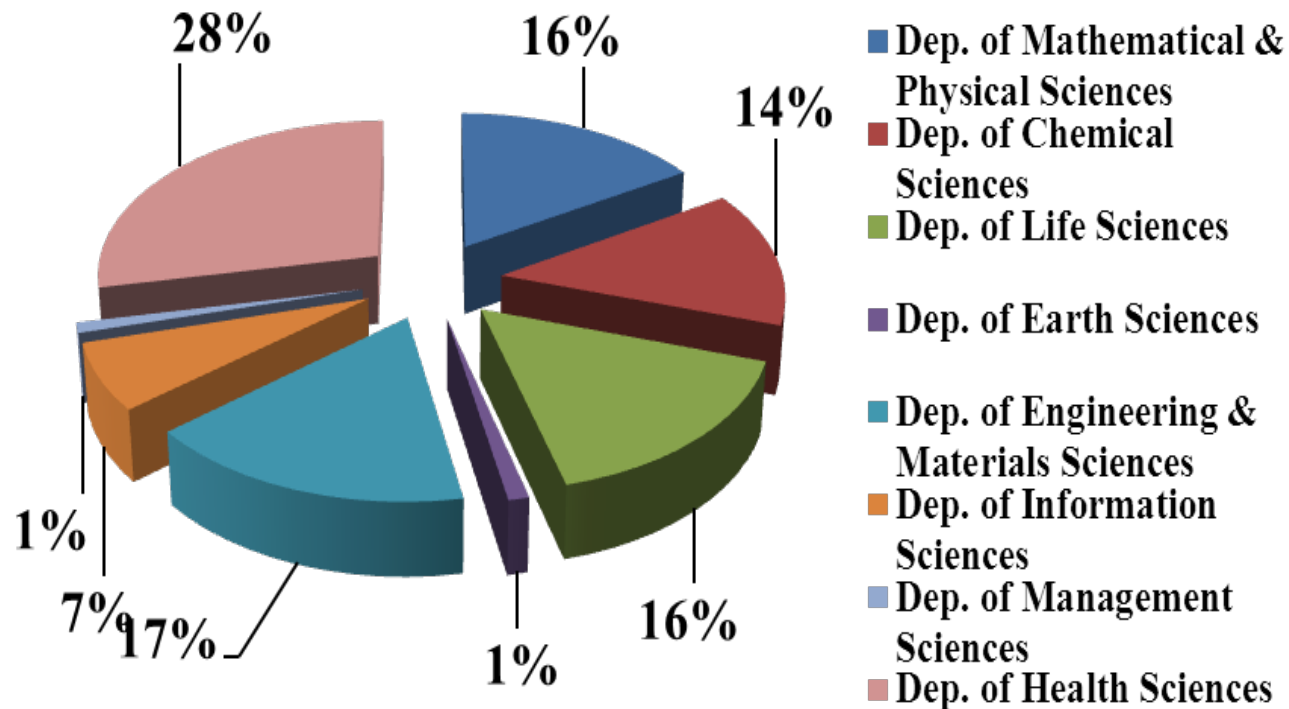
Distribution of Expenditure on Joint Research Programs between NSFC and its Partner Organizations (2012)



RCUK (UK) /NSF, NIH (USA) /CIHR (Canada)/ NRF (Korea) /JSPS, JST (Japan)/ DFG (Germany)/ANR (France)/NWO (Netherlands)/AF (Finland)/DNRF (Denmark)/ FWF (Austria) /VR(Sweden)/ DG-Research(EU)



*Distribution in Scientific Fields for Joint Research
Programs between NSFC and its Partner Organizations
(2012)*





Example for joint research projects

- ◆ NSFC-RCUK-EPSRC Joint research in the area of Smart Grids Related, 3 joint calls since 2012:

I. Research relating to smart grids--Integration of large Scale Renewables, including HVDC/Distribution Network Operation and Planning/Scalable flexible power systems operation and control, including risk and uncertainty

II. Smart Grids and Electric Vehicles

III. Grid Scale Storage for Intermittency

- ◆ Total 13 joint projects were granted, each project grants 1 Million Pounds + 3 Million RMB for 3 years
- ◆ Procedure: joint workshop-joint call-joint application submit to NSFC/EPSRC- mail review (separately)-joint panel meeting-final decision



Priority Fields for Division of EE

(1) The basis of the future smart grid

The basis for integration and transmission of large-scale of renewable power/energy storage system(including EV); self-healing theories and technologies based on multiple information sources; the supporting methodologies and technologies for the security of smart grid infrastructures; and the theories and methodologies for smart grid interaction and marketing mechanism and its implementation.

(2) Basis of HVDC related

(3) Power electronics device and equipment

(4) Interdisciplinary problems of energy saving, renewable energy utilization

(5) Electromagnetic biological technology---for EM characteristics / EM diagnosis methods /EM treatments of diseases



Thank you for your attention!

<http://www.nsfc.gov.cn>

