# The 31st STAG Board Meeting

## Theme I : S&T Policy Formation and Governance

### Panel Discussion:

# 1.3 Toward a New Mechanism for S&T Policy Formation and Governance

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# Outline

- **Summary of S&T Policy Decision Making and Management System (p.3~ p.8)**
- **Topic 1：S&T Policy Planning and Decisions**
- **Topic 2：S&T Resources Management**
- **Topic 3：Performance-based Program Management**
- **Discussion Topics**

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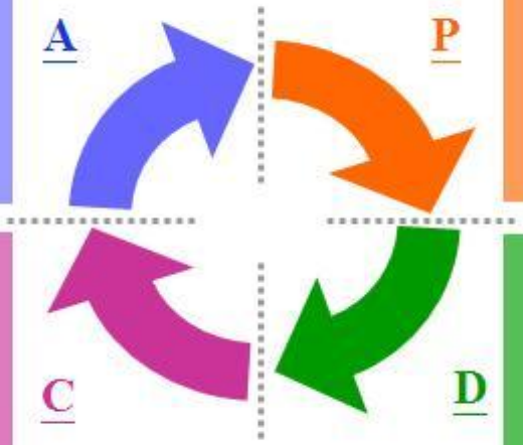
# PDCA of S&T Policy Cycle and Decision Management

**ACT**

Policy Amendment & Improvement

**PLAN**

Formulation of S&T Development Policies and Roadmaps




Performance Assessment of S&T Policies and Evaluation Mechanism

**CHECK**

Effective Use of Resources to Realize Policy Objectives

**DO**

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# Roles & Functions (before restructuring)

| STAG | NSC | Other Ministries |
|---|---|---|
| • National S&T policy planning and development<br>• Initiation of major S&T Programs and Plans<br>• Convening STAG Band industrial Board Meetings and Strategic Review Board Meetings<br>• Coordination of cross-ministerial S&T affairs | • Supporting national S&T development and research<br>— Planning and coordinating national S&T affairs<br>— Formulating medium-term S&T development projects<br>— Reviewing S&T projects at ministerial level<br>— Monitoring and evaluating S&T projects<br>• Supporting academic research<br>• Supporting the development of science parks | • Proposing and managing S&T policy at ministerial level<br>• Support and implement S&T R&D projects<br>• Managing S&T research results<br>• Promoting communication with society and industry<br>• Evaluating S&T project and policy performance at ministerial level |

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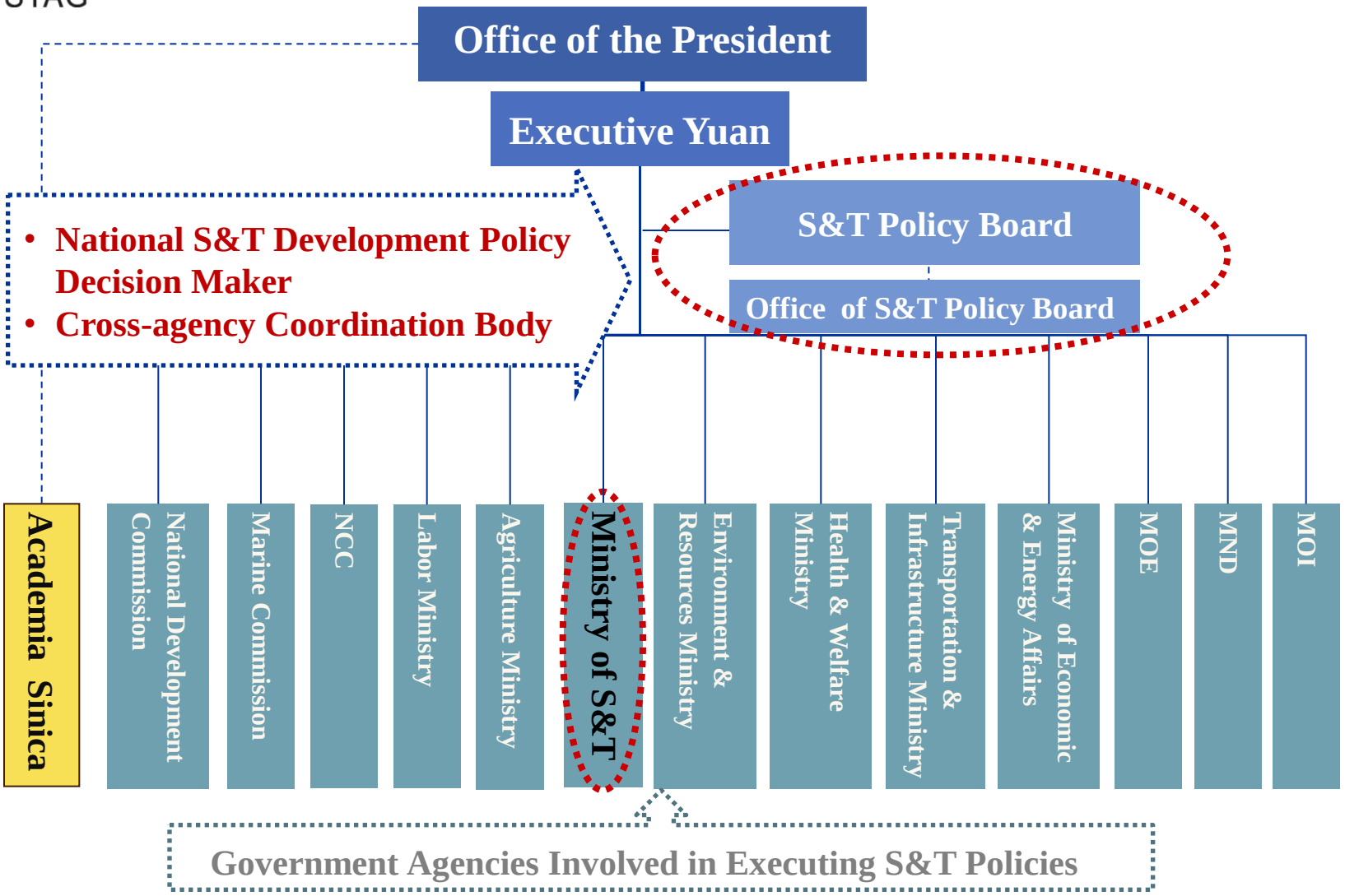
# Post-Restructuring



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# Roles and Missions of the Science & Technology Policy Board

1. Set policy guidelines and visions for national S&T development
2. S&T resource allocation at the Cabinet level
3. Review major S&T programs
4. Coordination of cross-ministerial S&T development affairs
5. Coordinate and commission major S&T strategy conferences
6. Advisory and consultation on other S&T development-related topics

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# Roles and Missions of S&T Ministry

1. **Propose national S&T development policies**
2. **Overall planning, coordination, and evaluation of government S&T projects**
3. **Support and implementation of basic research and applied S&T research**
4. **Implementation of major S&T projects**
5. **Support of academic research and advanced technology R&D**
6. **Support of development of science parks**

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# Roles and Functions (after Restructuring)

| Science and Technology Policy Board | Ministry of Science and Technology | Other Ministries |
|---|---|---|
| • Set policy guidelines and visions for national S&T development<br>• Initiation of major S&T Programs and Plans | • Supporting national S&T development and research<br>— Proposing national S&T development policies<br>— Overall planning, coordination and evaluation of government S&T projects<br>— Supporting major S&T research projects<br>— Organizing national S&T conferences<br>• Supporting academic research<br>• Supporting the development of science parks | The same as prior to restructuring |
| • **S&T resource allocation at the Cabinet level**<br>• **Review major S&T programs**<br>• **Coordinate and commission major S&T strategy conferences** | | |
| • Coordination of cross-ministerial S&T affairs | • **Planning nuclear safety policies and regulations** | |

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# Topic 1: S&T Policy Planning and Development

- **S&T Visions/Policies:**
  White Paper on Science & Technology, White Paper on Industrial Technology, National Science and Technology Development Plan
- **Major S&T Strategic Conferences:**
  STAG Board Meetings, National Science Conference, Strategic Review Board Meetings, Bio Taiwan Committee
- **Official and Expert Consultation:**
  Consultative Conferences with Advisors and Experts, Minister-level Coordination (Advisory) Conferences
- **Information Intelligence, Policy Review & Analysis:**
  Handled by S&T Policy Research Institutes and STAG Staff

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# Objectives of S&T Policy Planning and Decisions

- Alignment of S&T policies with overall national development
- Establishment of an appropriate cross-agency S&T coordination mechanism
- Clearly defined roles and missions and effective coordination
- Accountability and flexibility for S&T policies at ministerial level are important values embedded in the guidelines and visions for national S&T development
- Collaborative efforts is a must for the balance between top-down and bottom-up S&T policy development
- Formation of S&T policies should be centralized and consistent

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# Challenges in S&T Policy Planning and Decisions

- **A top down national S&T Policy Framework**
  - Korea, for instance, has the 577 Initiative
- **Alignment of bottom-up ministerial level S&T Policies**
  - NSC, MOEA, S&T-related agencies
- **A collaborative platform for think tanks and government agencies is in need, to review foresight studies and roadmaps for core technologies**

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# Case Study: Japan's S&T Policy-making System

- **Japan's 4th Science & Technology Basic Plan (as an example)**
  Japan's Council for Science and Technology Policy (CSTP) has served as a major platform in integrating policy recommendations from over 14 ministries and agencies, such as MEXT, METI, MHLW, and several think tanks to draft the overall framework (i.e. providing national directions and visions, outlining core policies and implementation measures) of Japan's S&T Basic Plans.
- **Contingency Mechanism for the March 11 Earthquake**
  CSTP has also been held as the contingency mechanism in diagnosing the weaknesses from Japan's previous S&T Basic Plans, especially on the problems such as overly concentrating on disaster prevention and rescue measures in urban areas and failing to consider the needs of suburban and rural areas. With the assistances from related government agencies, industrial and academic sectors, CSTP was able to amend the new 4th S&T Basic Plan on July 29th this year in accordance with the problems following the March 11 earthquake.
- **Lessons Learned:** Japan's CSTP has served as the major mechanism in integrating S&T policy suggestions from all government agencies, major think tanks, as well as industrial and academic sectors. Should any unexpected incident arise, timely response and flexibility must be maintained in modifying related S&T policies and redistributing S&T budgets among government bodies in a top-down style.

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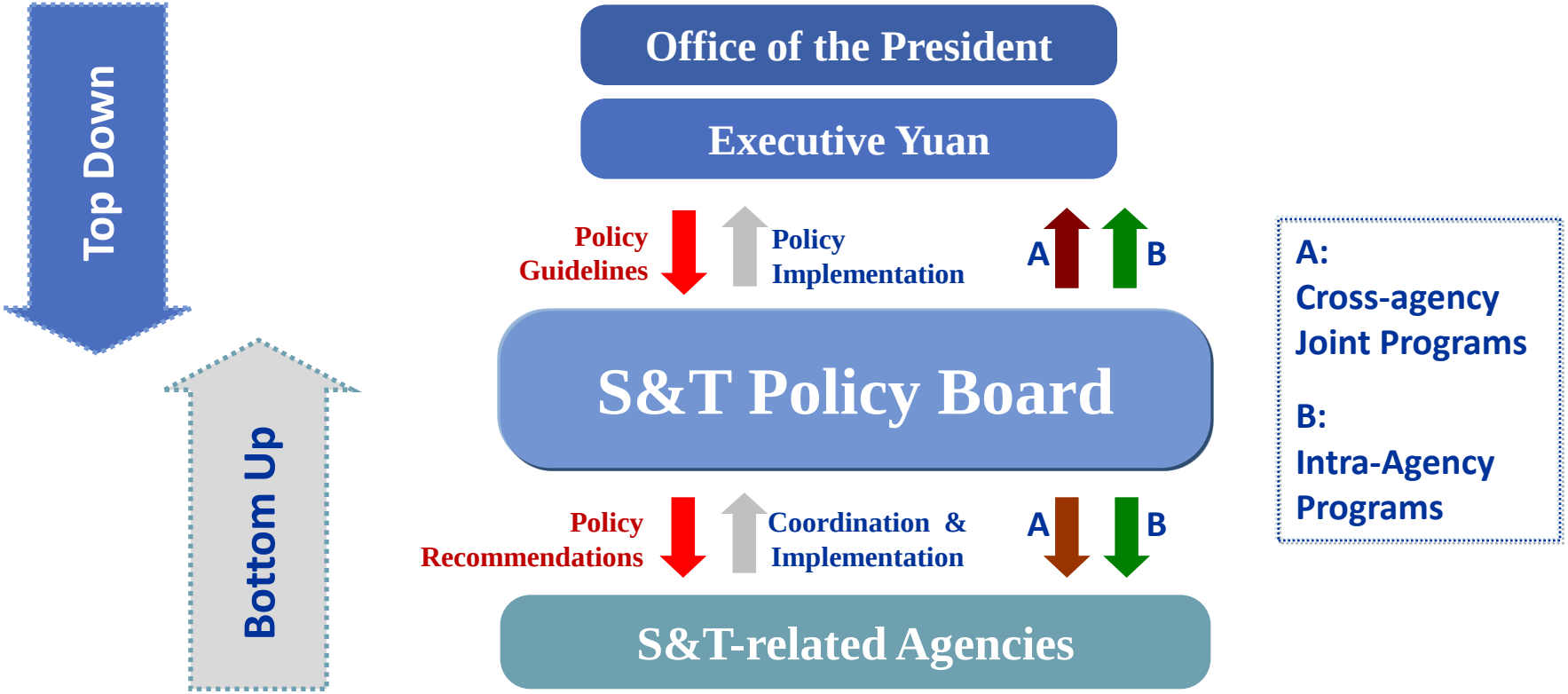
# Proposed Strategies for S&T Policy Planning and Decisions




- Science & Technology Policy Board as the platform to coordinate think tanks and government agencies.
- A collaborative platform to support and review foresight studies and core technology roadmaps.

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# Topic 2: S&T Resource Allocation

**Breakdown of S&T Budget:** Fiscal 2012 as an example

- Cross-agency Joint Programs (16.3%)
- Special Budget (4.9%) – Competitive Funding
- Key Projects(26.3%)
- Regular Projects (50.8%)
- S&T Projects Associated with Time-sensitive Policies and Plans (1.7%)

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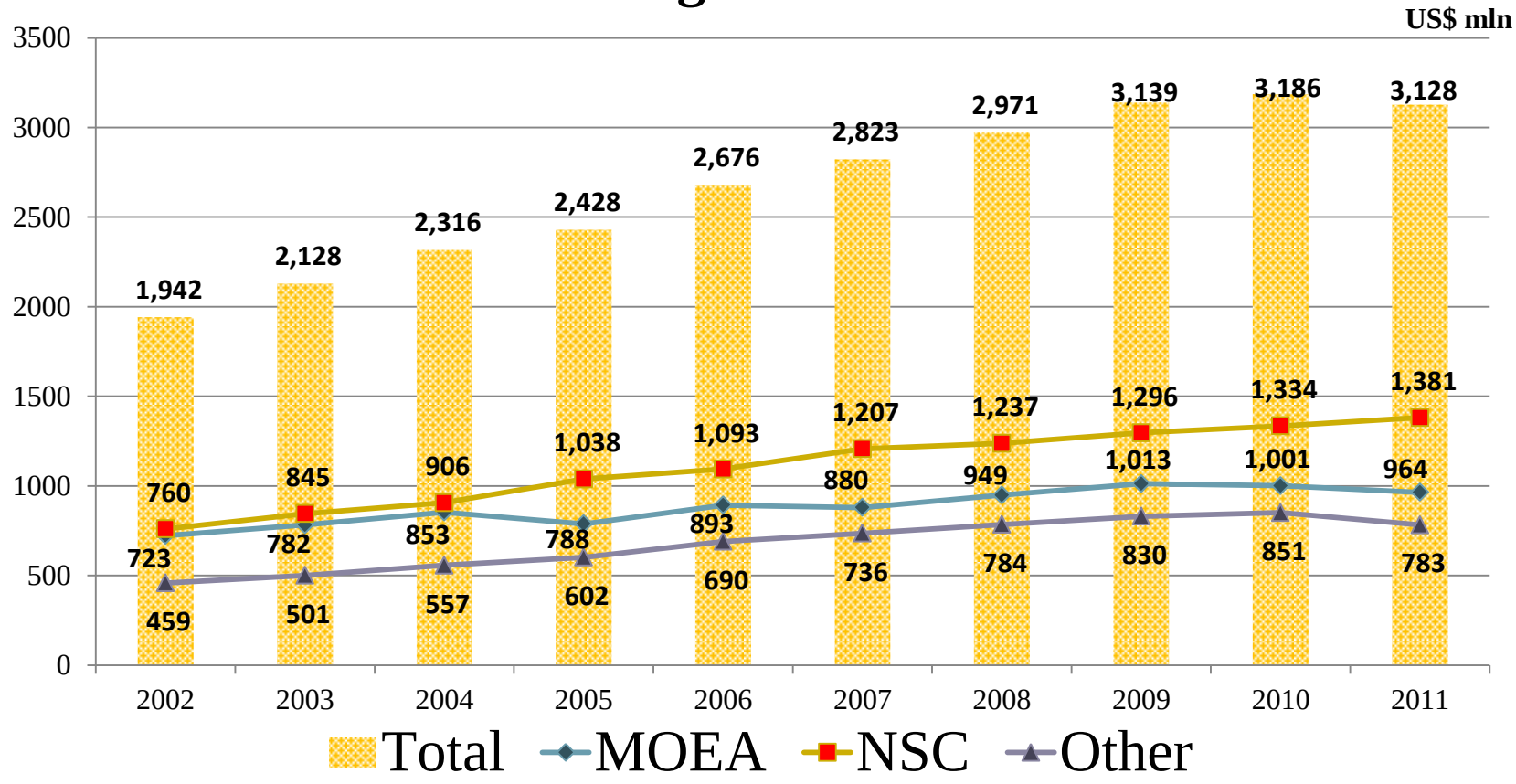
# Strong Growth in Basic Research; Slow Growth in Industrial Applications

## Budget Outlay for S&T Projects across Government Agencies over the Past Decade



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# Objectives of S&T Resource Management

- **Flexibility and accountability are important values to enforce S&T development missions at ministerial level**
- **Transparent and fair budget allocation among ministries, and the budget allocation must follow both the centralization and priority principles**

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# Challenges in S&T Resource Management

- **Inflexibility and Accountability of S&T Budget Scheme**
  - The NSC is mainly involved with basic and applied research with much less mandates.
  - The MOEA focuses on technology development and must coordinate with industrial development needs, the effects of trade liberalization, public wellbeing, and needs of the supply chain. It has to deal with complicated budget constraints.
- **Reasonable Allocation of S&T Budget**
  - Inflexibility in the allocation of S&T funding presents difficulty in harmonizing with emerging industry policies at national level.
  - A rolling scheme is not ready for S&T budgets.

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# Case Study: National S&T Programs

## National Science & Technology Programs

**Economic**
- Networked Communications Program
- National Program for Intelligent Electronics
- National Program on Nano Technology
- National S&T Program - Energy

**Biotech**
- National Research Program for Biopharmaceuticals

**Civilian**
- Taiwan e-Learning & Digital Archives Program

- Resources are relatively prioritized
- Programs are policy-driven, with little competition
- Resource sharing mechanism are not available
- Exit plans and rolling review are not required

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# Proposed Strategies for S&T Resources Allocation

- Guarantee quota for ministerial level S&T projects
- Provide a set percentage of competitive funding from overall S&T budget
- Initial funding in support of early engagement in priority areas (innovations, R&D, foresight programs, and policy board conclusions)
- Introduce a rolling schemes for S&T budgets for priority projects under time constraints or to meet policy mandates
- Include exit plan requirements as part of the process of budget decisions and performance review.

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# Topic 3: Performance-based Program Management

## Current State

- **S&T research results are determined by the economic benefits they potentially generate**
  - Investment dollars, job opportunities, production value
  - Number of papers published, training and results, academic status
  - Technology transfers (technology transfer payments and royalties) and patents
- **Review of final reports in written form, project deliverable presentations, field visits**

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# Objectives of Performance-based Program Management

- Identify goals and benchmarks for S&T policies at ministerial level
- Transparency: Optimize resource allocation
- Accountability: Performance assessment results and budget allocation should be closely linked
- Alignment of the national S&T policy guidelines and visions, with ministerial level S&T development strategies

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# Challenges in Performance Management of S&T Policies

- **Identify Performance Indicators**
  - Review existing benchmarks and performance indicators
  - How to set performance indicators for cross-agency and agency-specific programs?
- **Ownership transfer of cross-agency joint programs and exit plans requirements for priority programs**
- **Evaluation challenges such as early engagement risks in S&T programs**
- **Budget decisions as the tool to require subordinated institutions and research bodies to meet policy mandates**
- **Project evaluation as the reference and feedback to S&T policy-making and budget decisions**

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# Proposed Strategies for Policy Evaluation

- **Identify Quantitative and Qualitative benchmarks over Short-, Medium-, and Long-term Objectives**
  - Quantitative, intangible, and qualitative performance indicators to align with national short-, medium-, and long-term visions
- **S&T Policy/Project Management and Budget Allocation**
  - A set percentage of competitive funding from overall budget
  - Exit plans and ownership transfer required for priority programs
  - Funding decisions will depend largely on performance review

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# Discussion Topics-1

- **S&T Policy Planning and Decisions**
  - Is budget support available and sufficient for top-down policy framework and visions?
  - Is it viable to set up a collaborative, integrative platform to coordinate various think tanks to review foresight studies and core technology roadmaps?
  - Identify an effective and efficient platform for policy planning and resource allocation

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# Discussion Topics-2

- **S&T Resources Allocation**
  - Guarantee quota: identify the types of S&T programs and their appropriate weights in budget scheme
  - Priorities and time constraints: 1. policy guidelines from the Cabinet or above; 2. quota management
  - Competitive funding:  1. previous year as the decision base; 2. priority programs (as in present practice)
  - A mechanism for adjustment after project approval and budget allocation
  - Exit plan requirements to be part of the process of performance review and budget decisions

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# Discussion Topics-3

- **Identify Quantitative and Qualitative benchmarks over Short-, Medium-, and Long-term Objectives**
  - Quantitative, intangible, and qualitative performance indicators to align with national short-, medium-, and long-term visions
- **S&T Policy/Project Management and Budget Allocation**
  - A set percentage of competitive funding from overall budget
  - Exit plans and ownership transfer required for priority programs
- **Budget decisions as the tool to require subordinated institutions and research bodies to meet policy mandates**
- **Project evaluation as the reference and feedback to S&T policy-making and budget decisions**