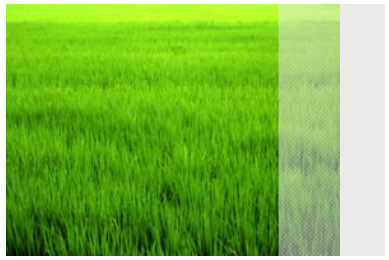

27th STAG Board Meeting
Advancing Taiwan's Technology Development Systems

Report 2 : Review of Taiwan's Science and Technology Decision-Making and Management Mechanism

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2007/12/18

Outline

I Foreword

II Ideal S&T Policy Decision-Making and Management Mechanism

III Taiwan's Current S&T Policy Cycle

IV Challenges of Current S&T Policy Cycle – Cases Studies

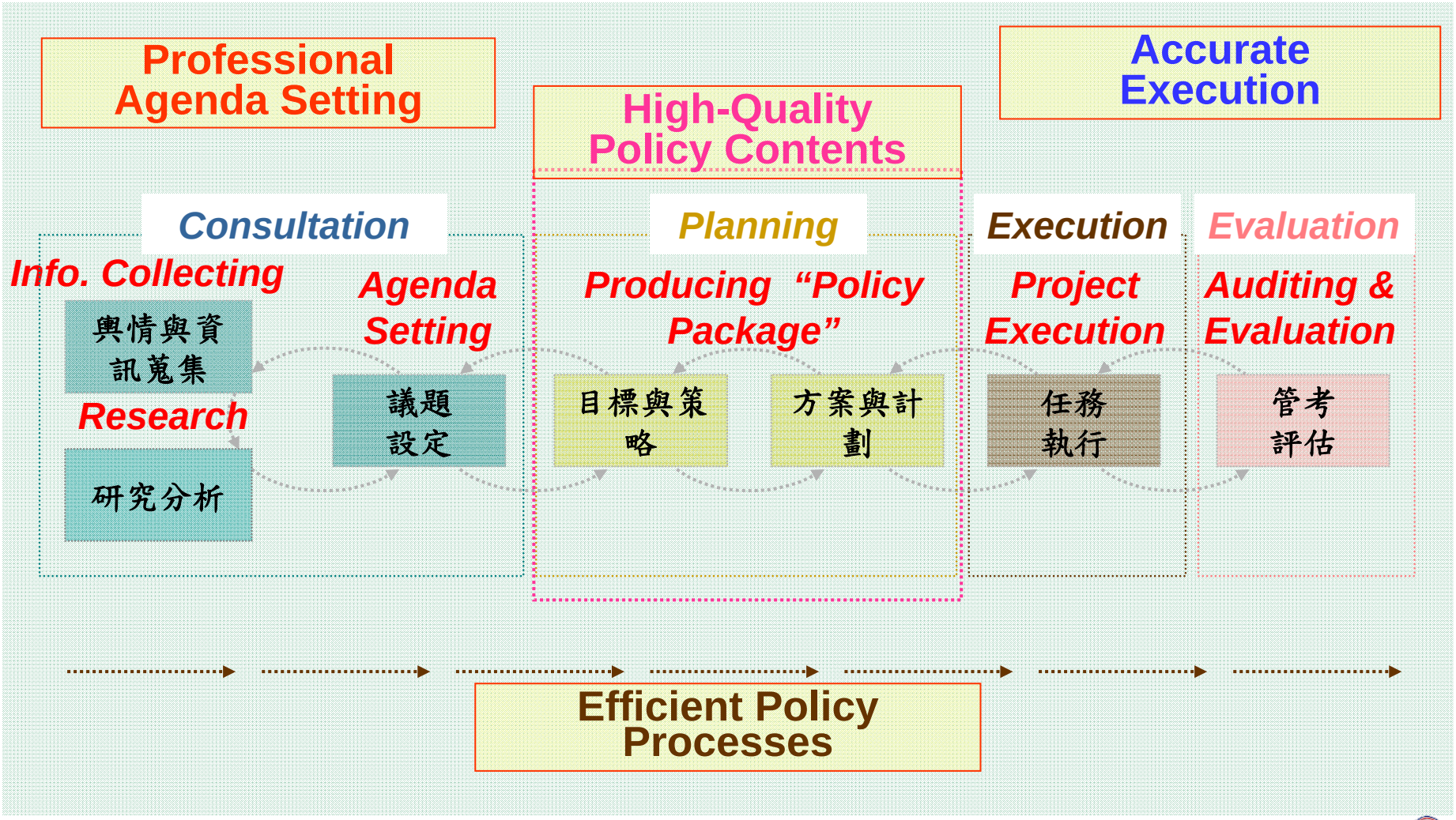
V International Trends and Best Practices

VI Taiwan's Future Adjustment Directions

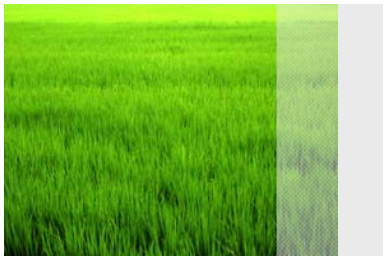
I. Foreword

- Many important and valuable recommendations were given by the advisors in the past STAG Board Meetings.
- Following these advices, many S&T policy adjustments were done under the S&T policy cycle, and **produced a great impact on Taiwan's S&T development system.**
- **To further enhance the S&T development system,**
- **Methods of improvement for the S&T policy supporting system are suggested and possible beneficial results stated.**
- Reviewing Taiwan's current S&T policy cycle, analyzing two policy formation case studies, and referring to international trends and best practices.

II. Ideal S&T Policy Decision-Making and Management Mechanism



Source: Y-L. Luo, STPI



III. Taiwan's Current S&T Policy Cycle

III. Taiwan's Current S&T Policy Cycle —Agenda Setting and Policy Planning

Principal National Policy

Economic Development Vision for 2015
Challenge 2008-National Development Plan

S&T Development Vision

National S&T Develop. Plan, White Paper on S&T

Major S&T Committees Or Meetings

Conf. on Sustaining Taiwan's Eco. Development, Science & Technology Meeting, National S&T Conference STAG Board Meeting, Emerging Ind. Tech. SRB Meeting, Bio Taiwan

Related Committees

Energy Policy and S&T Development Steering Committee, Biotechnology Industry Guidance Task Force, National Information & Comm. Initiative Committee, National Information and Comm. Security Taskforce.. etc.

policy outlines drafted by government agency

mid-term framework programs proposed by government agency

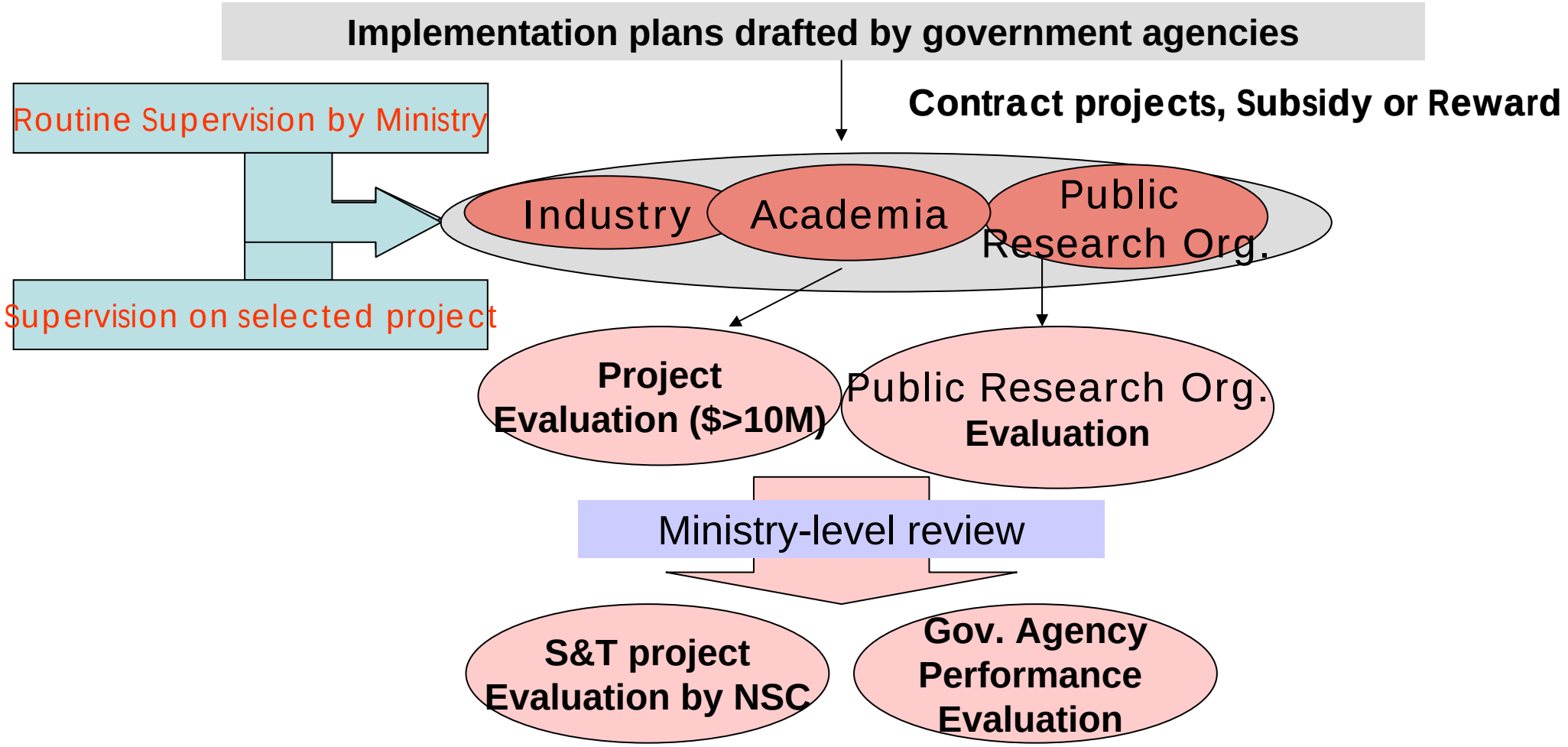
annual S&T plans and budgets allocation

Performance review on five major categories

Priority projects | National S&T Programs | General S&T projects

Implementation plans drafted by government agencies

III. Taiwan's Current S&T Policy Cycle —Execution and Evaluation

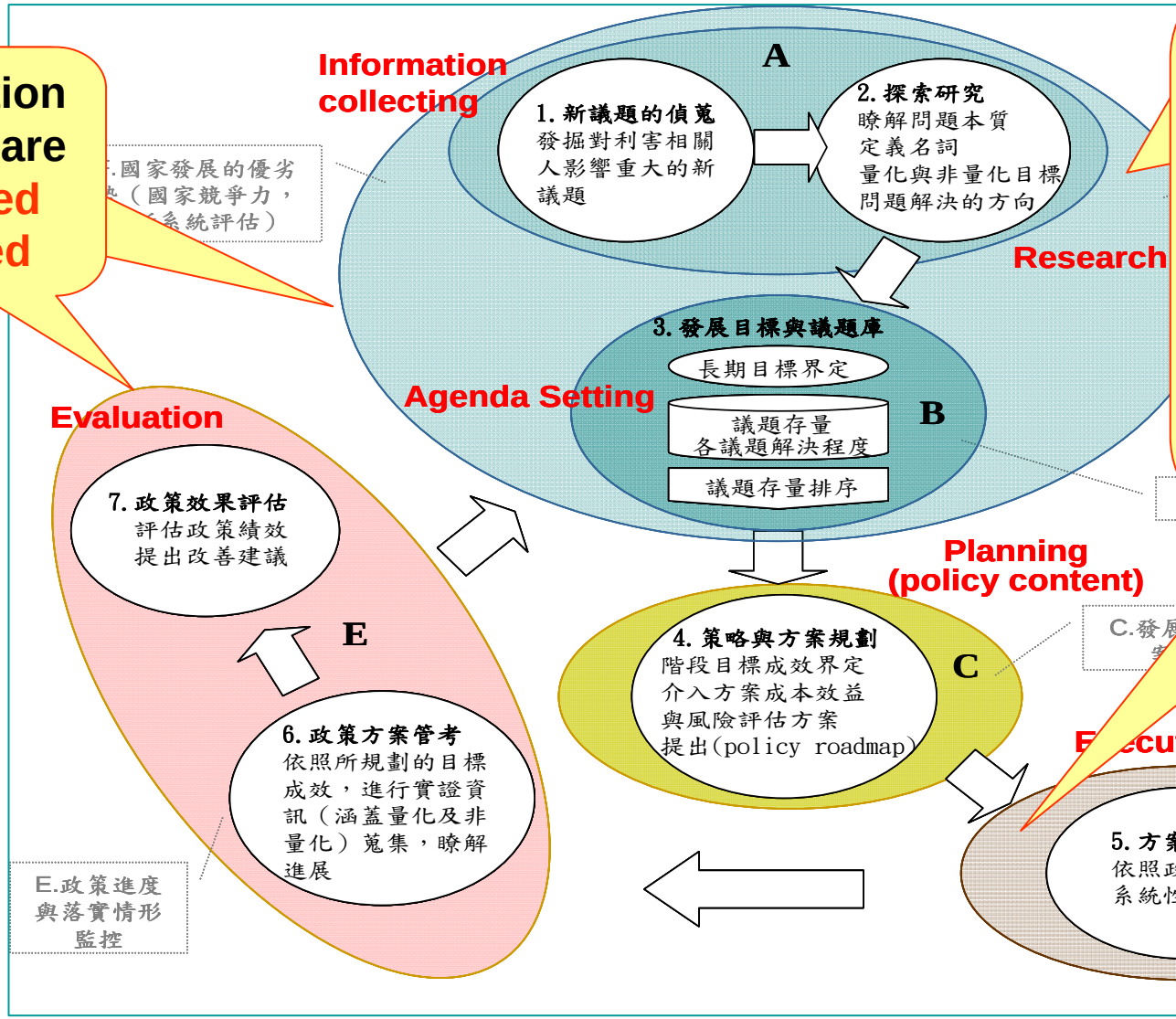


Please refer to the appendix for keys

III. Taiwan's Current S&T Policy Cycle —Major Characteristics (1)

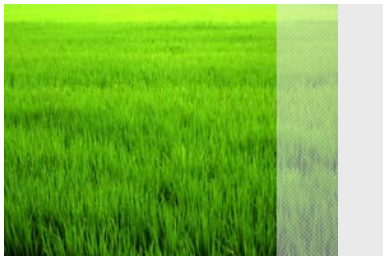
- **Agenda Setting**
  - ✓ S&T programs are based on different sources of policy documents, such as top-down, bottom-up and expert opinions.
- **Policy Planning**
  - ✓ Policy planning is based on related annual, mid-term and long-term programs and iterative reviews.
  - ✓ Ministries' mandates and actual needs are taken into account in their budget review.
- **Execution and Evaluation**
  - ✓ Policy issues, including implementations of subsidy, reward, and procurement, need careful review.
  - ✓ The review process involves experts from government, industry, academia and research institutes.

III. Taiwan's Current S&T Policy Cycle — Major Characteristics (2)



Evaluation results are not feed backed

- **Ministries and experts play key roles.**
- **What should be established? 1) decision-making information disclosure, 2)professional decision-making support group, 3) systematic policy analysis, and 4) effective cross-agencies coordination.**



IV. Challenges of Taiwan's Current S&T Policy Cycle – Cases Studies

IV. Challenges of Current S&T Policy Cycle
Cases Studies: Ind. Manpower, ISR and U-Taiwan

- 26th STAG Board Meeting: Suggestions from the panel on the **PROFESSIONAL WORKFORCE** theme.
  - "We recommend university to establish research centers and invite industry to actively participate with funding both from government and industry. We also recommend government regulations should **increase incentives for faculty members to participate** in industry collaboration and activities."
  - "We also recommend that **a taskforce at the premier's office** be considered for coordinating various human resources development programs currently under the jurisdiction of different ministries."
- 26th STAG Board Meeting: Suggestions from the panel on the **U-Taiwan** (Ubiquitous Taiwan) theme.
  - "It would be necessary to **understand the nature of ubiquitous services and their demand**, develop new processes and regulations, and educate users. One of best ways to address these challenges is learn from actual service deployment."

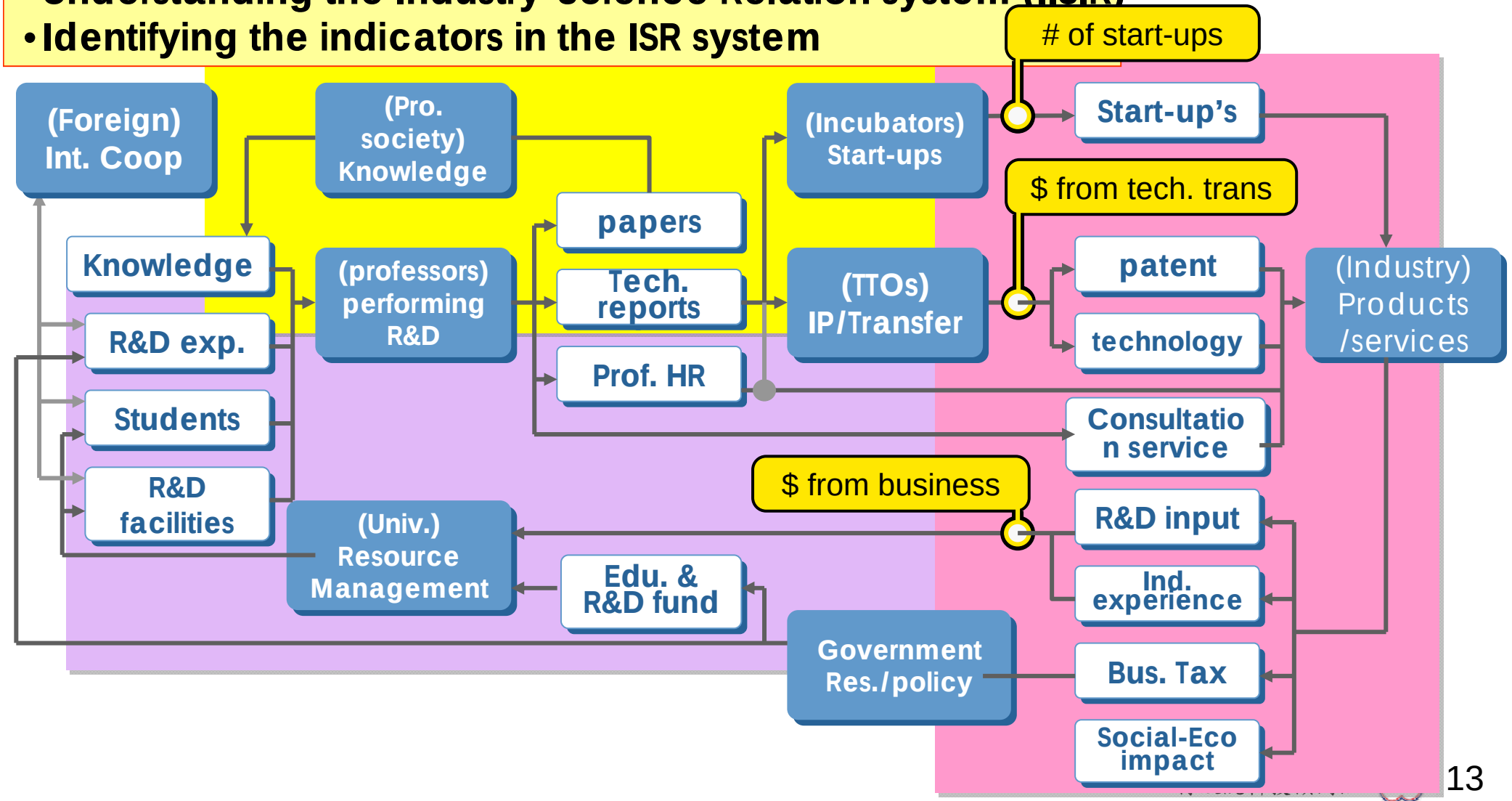
IV. Challenges of Current S&T Policy cycle
– Case Studies: Industrial Manpower Package,

The Industrial Manpower Package has integrated related policies under a common vision.

Supporting strategies	Integrating manpower supply and demand data, and making timely adjustments to manpower resources strategy.	1 Establishing an integrative mechanism for supply and demand surveys
Timeous strategies	Carrying out specialized job skills training and cultivation, to supply industry with technical manpower as and when needed.	2 Developing job skills training for key industries 3 Expanding industry-related academic courses
Rooting strategies	Stressing practical utility in education, to root technical and R&D manpower.	4. Launching an industrial manpower rooting program 5. Pepping up the flexibility of the higher education system 6. Reconstructing the technical and vocational education system 7. Actively heightening the internationalization of education
Linkage strategies	Strengthening linkage between industry and academia, to expand innovative manpower.	8. Adding value to the joint innovation from industry -academia (research sector) cooperation 9. Competing to recruit international specialist talent

IV. Challenges of Current S&T Policy cycle – Case Studies: Ind. Science Coop. System

- Understanding the Industry-Science Relation system (I.S.R)
- Identifying the indicators in the ISR system



IV. Challenges of Current S&T Policy cycle Cases Studies: Industry-Science Relation (I.S.R) policies

Cross-Ministerial Platform

ISR Ministers Meetings

ISR Vice-Ministers Meetings

Strategy 1

STAG, NSC (MOE, MOEA)

A
Programs Of Performance Evaluation
-Build up IP Transfer Information System
-Enhance S&T Statistic compilation

2005	Four Objectives	2010
5.8%	1.To double the funding from business sector	10%
0.5%	2.To double the tech-transfer income	1%
707	3.To double the number of start-ups	800
	4. To loosen the laws and regulations	

Strategy 2

Twin core Strategy

B
To Adjust S&T resourcing strategy

C
To Integrate and professionalize the R&D, incubation, tech-transfer in Academias

NSC (MOE, MOEA)

MOE (NSC, MOEA)

Strategy 3

Infrastructure and Interconnection

D
To joint-reward excellent ISR R&D results and successful cases

E. To encourage set ups of management mechanism in Academia

F. The loosening of laws and regulations

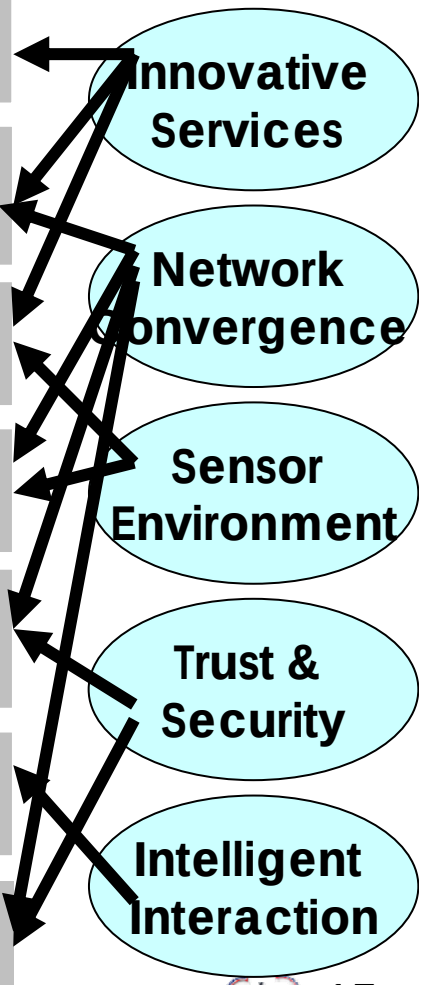
MOE, NSC, MOEA

IV. Challenges of Current S&T Policy cycle – Cases Studies: Polices for U-Taiwan

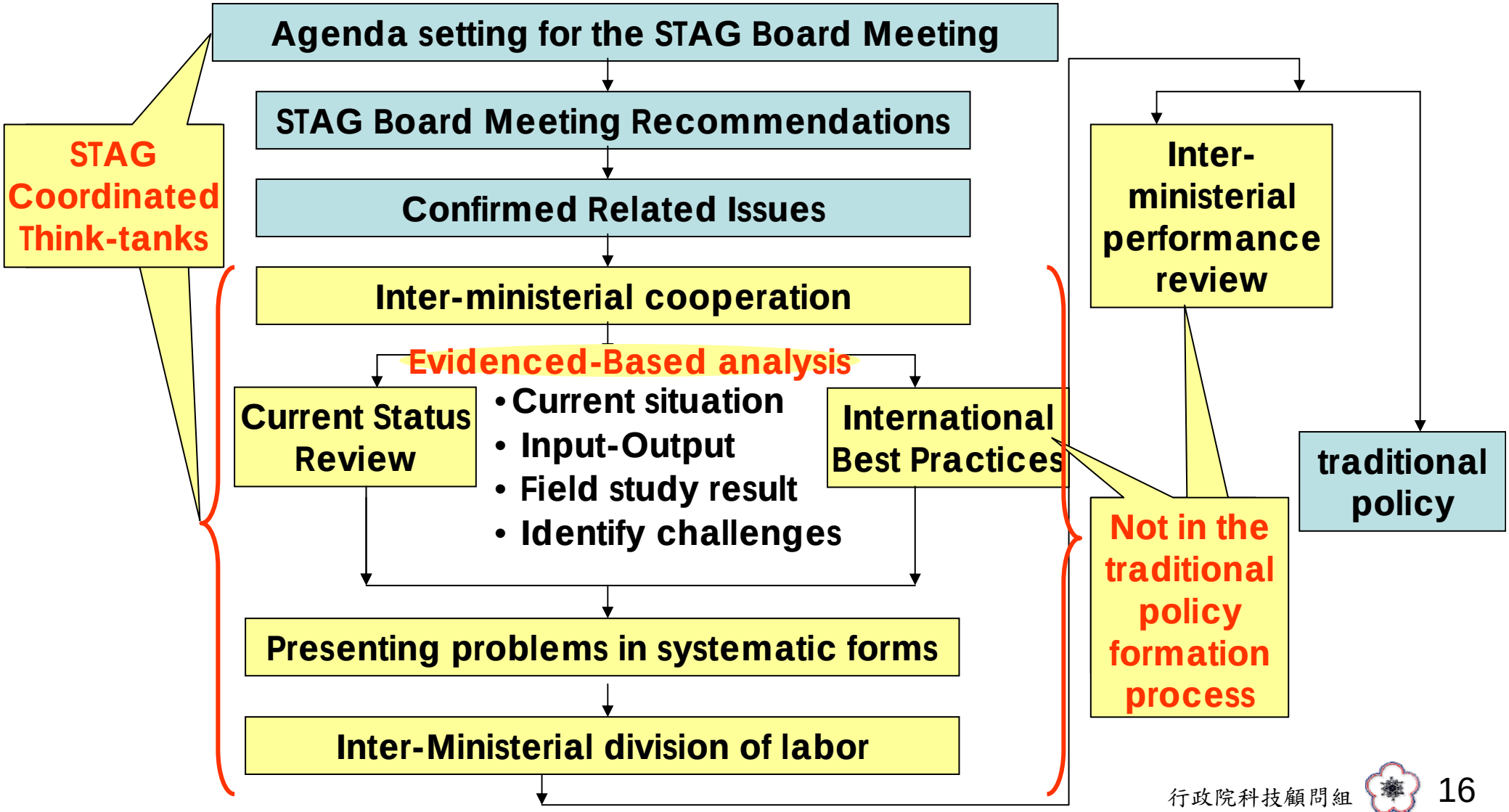
For Development Needs

(Innovate Taiwan)

Promote ICT Basic Law、enrich digital content、raise ICT literacy、cultivate talents	I	Infrastructure
Establish wireless broadband and sensor network, and affordable applications and digital convergence	N N	Next Generation Network
Bridge digital divide, and to develop low cost ICT devices for disadvantage group.	O	e-Opportunity
Study key ICT technology to promote ITeS, establish industry advantage	V	Value-added ITeS
Focus on general and non-PC users point of view, promote life enhancing applications.	A	Life Enhancing Applications
Advocate the liability of ICT security of public and private sectors, and to build National Security Operation Center (NSOC).	T	Trust Taiwan
Promote innovate government services, and encourage citizens participation.	E	Electronic Governance



IV. Challenges of Current S&T Policy Cycle – Case Studies: Policy formation process following the STAG Board Meeting



IV. Challenges of Current S&T Policy cycle
– Cases Studies: Characteristics in the Model

Major Characteristics in the Model

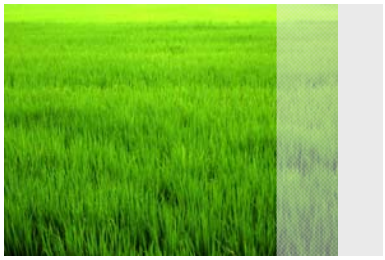
- STAG acts the role of guidance and promotion once the STAG Board Meeting is activated;
- In the STAG Board Meeting agenda planning phase, think tanks assist drafting related policy agenda;
- In policy planning, intuition and speculation is replaced by expert experiences and evidence-based research;
- Onsite visits and overall research analyses are done simultaneously;
- During policy analysis, policy agenda are planned systematically, with "pulse-taking points" (key indicators) clearly stated;
- Emphasis on communication with stakeholders (industry-academia and inter-ministries) is stressed;
- In the assessment phase, think tanks accommodate with the current mechanisms and objectively provide assistance on observations, analyses, and evaluations of policies.

IV. Challenges of Current S&T Policy cycle

- **Problems and Challenges existed in inter-Ministerial policy implementation**
  - policy are formed through arbitrary routes and priorities are unclear;
  - Objectives are diverse and unable to connect effectively with follow-up policies;
  - Different administrations use different support systems and promote their own policies, resulting in the absence of effective integration or competition mechanisms;
  - The time frame for policy formulation is too short due to the annual budgeting approval schedule;
  - Systematic advance and follow-up policy evaluation is lacking.

IV. Challenges of Current S&T Policy cycle

- **Problems and challenges of science and technology supporting system**
  - During policy assessment, the experience source is based on individual research and observation, and lacks systematic research;
  - Domestic think tanks do research mainly on the industry and economic fields, and leave insufficient people working on S&T policy research. In the academic sector, the capacity is scattered;
  - S&T decision-making support is mostly formed by organizations with temporary tasks, and causing difficulty in accumulating professional S&T decision-making supporting capability.



V. International Trends and Best Practices

V. International Trends and Best Practices

-Policy Challenges from Trends of S&T

- **Important Trends of Science and Technology Development:**
  - R&D priorities gradually shift from discovery to practical applications;
  - Knowledge application development becomes important and new ways of using both hardware and software technology in simulating hardware design emerges as a more precise and pragmatic method;
  - Expectations from society for S&T R&D are increasing.

Challenges to S&T policy cycle:

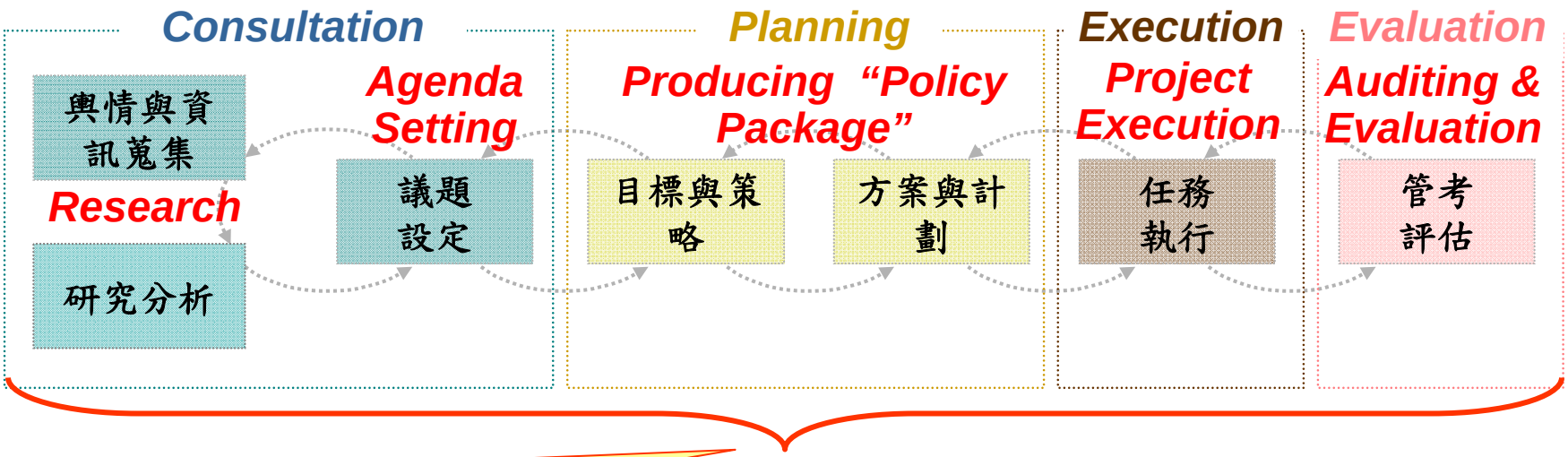
How are responsibilities for STI policy divided across the different ministers, departments, agencies and intermediaries? What co-ordination mechanisms are in place? **How is decision making taking place? How to formulate a system of strategic intelligence (supporting system)?**

V. International Trends and Best Practices

-- Trends of Policy Concepts to Respond

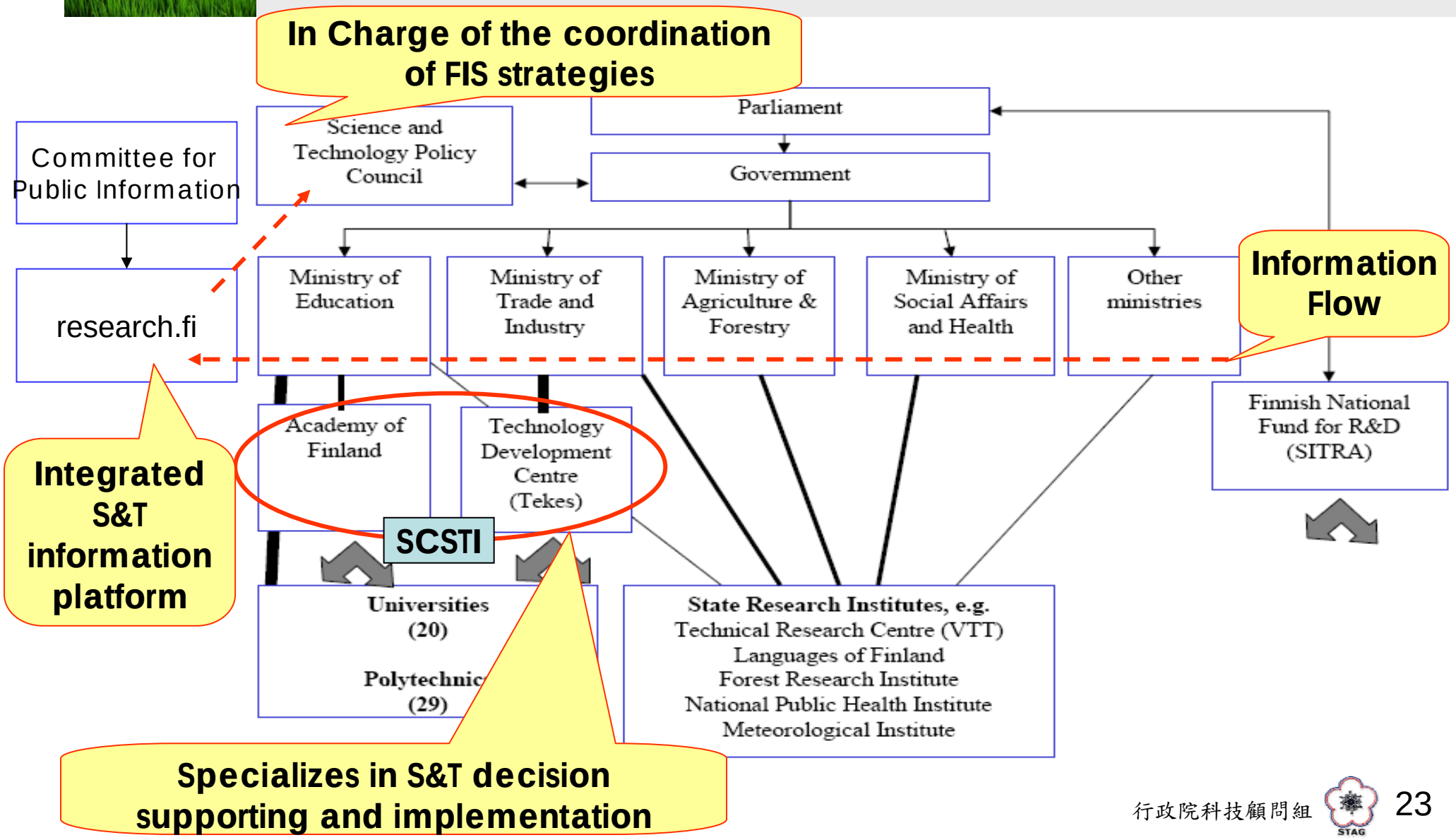
1. Setting clear Vision and Direction
2. Emphasize horizontal coordination (inter-ministries), and vertical control

Enhanced the cooperation between knowledge makers and users



1. Follow the principles of "New Public Management", including: Creating quantitative objectives and indicators for performance evaluation, entrusting programs to agencies/research institutes to produce inducement, and respecting the market and competition mechanism.
2. Pay more attention to strategic intelligence, combining experience and evidence-based analysis.

V. International Trends and Best Practices
--Best Practices, Finland



V. International Trends and Best Practices --What seems to work

Agenda Setting

- **Councils, Chief Science Advisors:** function well if they have real power, in terms of priority setting and/or allocation of funding, and support from strategic intelligence.

Planning

- **Coordinative Bodies, White Papers / Strategy documents,** work best if linked to budget allocation

Implementation

- **Programs/ competitive funding / performance based contracts:** the most 'incentive-compatible' way to ensure coherence and inject some flexibility into the system.

V. International Trends and Best Practices -Some lessons on what better not to do

Agenda Settings

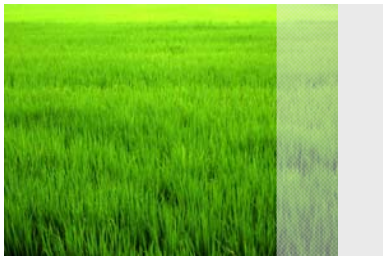
- Create **too many** advisory bodies with no real task/means,
- Change institutions **too often**
- Create institutions with **limited tasks** and let them stay forever

Planning

- Write **too many** strategy papers
- Create **too many** coordinative bodies or organizations
- Create **coordination mechanisms for coordinative bodies**

Implementation

- Create **strong agencies** – and shed your capacity for strategic policy formulation



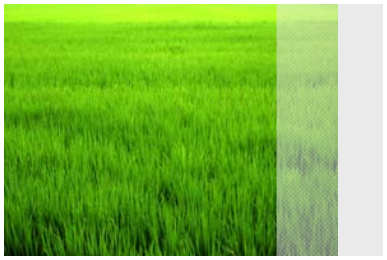
VI. Taiwan's Future Adjustment Directions and Benefits

VI. Taiwan's Future Adjustment Directions

- **To enhance Taiwan's S&T policy cycle performance, the following should be done:**
  - Integrate the existing goal-formation mechanisms, to deepen related domestic capabilities;
  - Establish inter-ministerial integrated planning, execution, and evaluation mechanisms for important agendas;
  - Perfect policy evaluation system and feedback mechanism, including establishing indicator collection systems and decentralized evaluations.

VI. Taiwan's Future Adjustment Directions

- **To improve Taiwan's S&T decision-making support system the following should be done:**
  - Effectively utilize the university and think tank capacity, by forming a professional S&T decision-making system, such as specialty in division of labor, establishing policy knowledge sharing platforms, and strengthening channels of decision-making and policy research communication;
  - Establish plans for expanding decision-making capability of universities and think tanks by, for instance, achieving individual nurturing and encouraging competition, then reaching outward for proposing policy research plans to other nations.



Thank you,
Comments are Welcomed!

KEY

- STAG - Science and Technology Advisory Group
- NSC- National Science Council
- MOE- Ministry of Education
- MOEA-Ministry of Economic Affairs
- P.R.O – Public Research Organization
- I.S.R –Industry-Science Relation
- U-Taiwan Program – Ubiquitous Taiwan Program