

# Current status of program evaluation focusing on outcome measures of funding programs at Japan Science and Technology Agency (JST)



**Workshop on Science and Science Policy at NSF**

Presentation time: 12 minutes

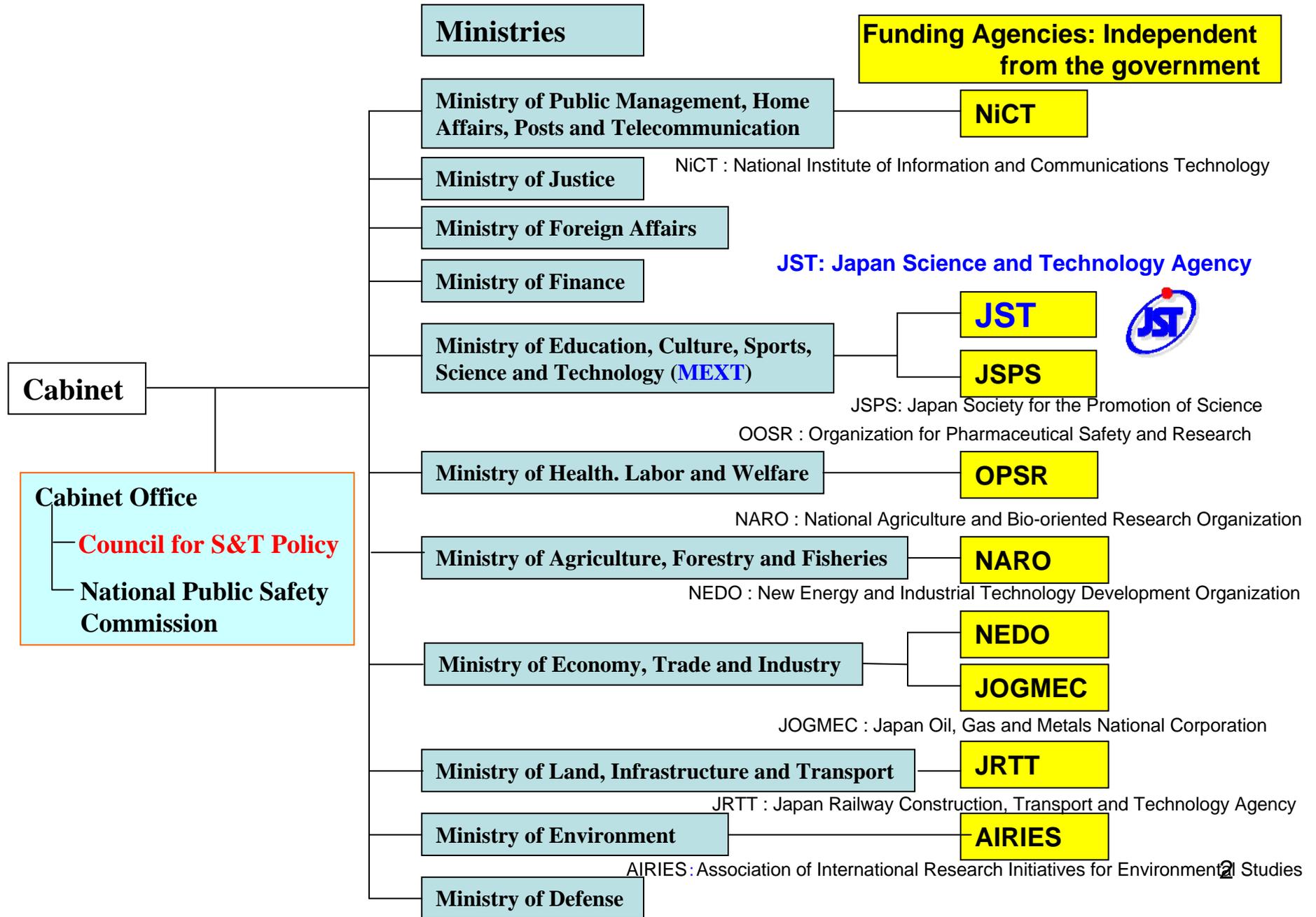
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# Ministries and Funding Agencies for S&T



# As a mission agency, JST has five main operations



(※Budgets in 2008)

**I. "Creating Advanced  
Technology"**  
**¥58.4 bil. (\$584 mil.)\***

**II. "Promoting business  
using advanced  
technology"**  
**¥24.1 bil. (\$241 mil.)\***

**III. "Promoting  
dissemination of  
scientific and  
technological  
information"**  
**¥10.8 bil. (\$108 mil.)\***

**IV. "Researcher  
exchange and  
research support"**  
**¥3.3 bil. (\$33 mil.)\***

**V. "Promoting  
understanding of  
science and  
technology by the  
public"**  
**¥10.0 bil. (\$100 mil.)\***

# “Creating Advanced Technology” operation



MEXT designates strategic research policies (called sectors) JST considering national S&T policy and social & economic needs

In order to realize the policies, JST designs programs (called research areas) and manages them using three types of funding frameworks depending on program features

**PRESTO** \$0.3~0.4mil./3yrs  
\$0.5~1.0mil./5yrs

- ✓ Precursory research for embryonic science and technology
- ✓ For relatively small scale research subjects carried out by individual researchers
- ✓ A program manager manages a program which includes 10~40 research projects for normally 8 years

**CREST** (\$2~6mil./5yrs /team)

- ✓ Core research for evolutionary science and technology
- ✓ For relatively large scale research subjects carried out by research teams
- ✓ A program manager manages a program which includes 5 ~20 research projects for normally 8 years

**ERATO**(\$15~20mil./ 5yrs)

- ✓ Exploratory research for advanced technology
- ✓ For subjects like transformative research subjects carried out by specially formed research group
- ✓ A program manager leads a research group to create new research fields
- ✓ In case of ERATO, a program = a project

Outcomes are “Creation of Advanced Technology” in General

# Programs ( called research areas) arranged in 2007



## (1) Programs started in 2007 using a PRESTO framework

1. Materials and processes for innovative next-generation devices 11 projects (~x3)
2. Innovative model of biological processes and its development 11 projects (~x3)
3. Alliance for breakthrough between mathematics and sciences 12 projects (~x3)

## (2) Programs started in 2007 using CREST frameworks

1. Creation of a novel technology towards diagnosis and treatment based on understanding of molecular pathogenesis of psychiatric and neurological disorders 5 projects (~x3)
2. Fundamental technologies for dependable VLSI system 4 projects (~x3)
3. research of innovative material and process for creation of next-generation electronics devices 6 projects (~x3)

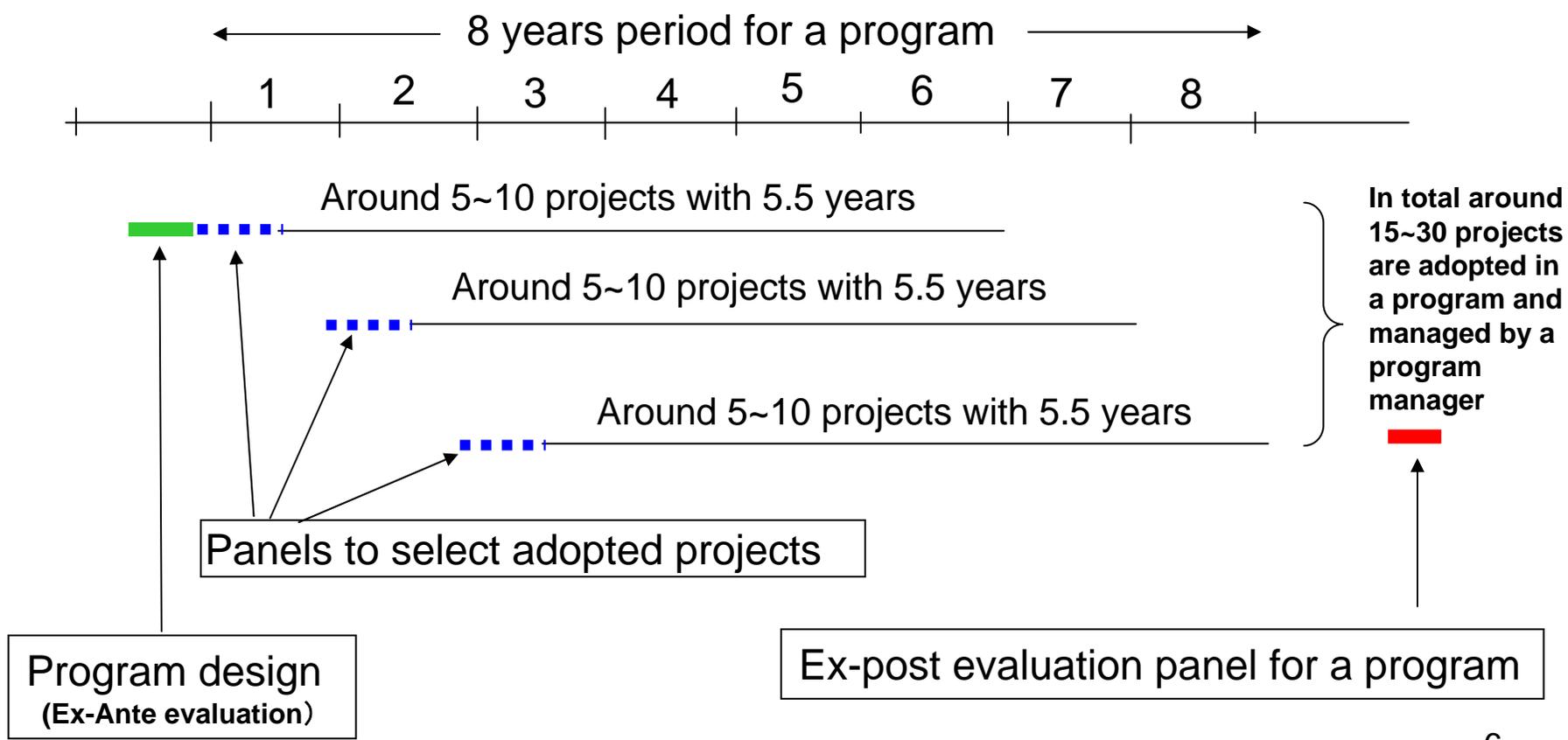
## (3) Programs(=independent projects) started in 2007 using ERATO framework

1. Integrated pores project
2. Stem cell and organ regeneration project
3. Design interface project
4. Human-sensing fusion project
5. Nuclear spin electronics project



# Typical funding scheme of a program (called research area) carried out by PRESTO and CREST frameworks

Around 10~15 new programs are arranged every year, and normally each program has 8 years period, and around 5~10 projects with 5.5 years research period are adopted every year for first 3 years.



# How to measure outcomes of each program

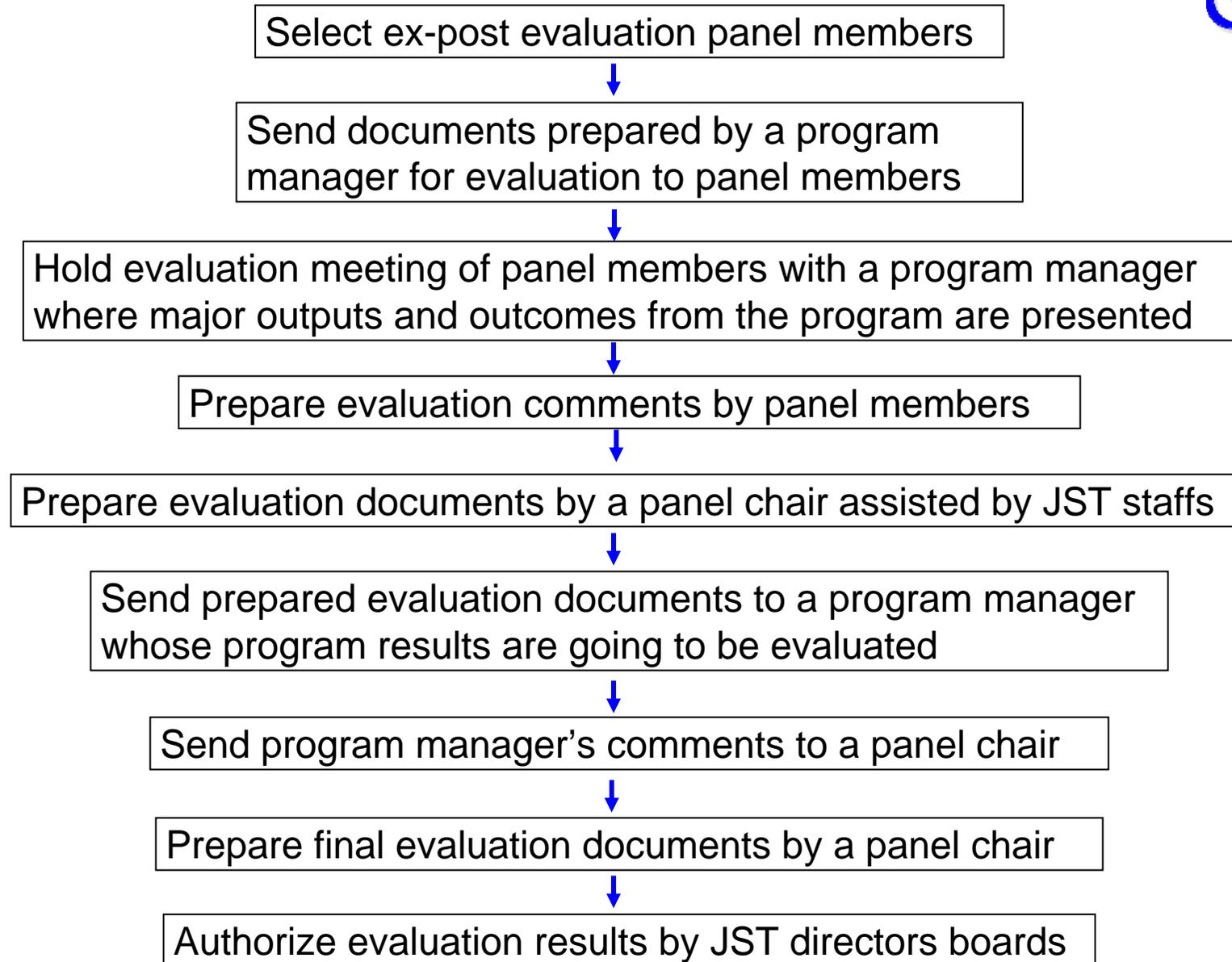


Since each program is to support basic research, it is not easy to get observable outcomes, then total performance of each program is evaluated as outcomes by an ex-post evaluation panel constituted by experts supported by JST's staffs.

## Outcome evaluation indicators for measurement:

1. Total performance evaluation by an ex-post evaluation panel
  - If the new research field of the program has been internationally established?
  - If the established research field has been supported by other funding?
  - If the program has been designed and managed significantly?
  - If the creative value or creative research results have been obtained?
  - If the program has contributed to the research potential in Japan?
2. Symposiums, workshops and questionnaire surveys are held to complement the evaluation mentioned above as well as to introduce outcomes to the public.

# Process of ex-post evaluation for each program



## Samples of outstanding project-outcomes of PRESTO(P), CREST(C) and ERATO(E)



### Indicators of outstanding project outcomes:

- I .Expected market size is more than \$100 million.
- II .Breakthrough of basic research is recognized.
- III.(Semi-)Industrial products have been realized.

Samples of outstanding outcomes which meet excellence indicators described above

1. Development of Induced pluripotent stem cell which may solve essics issues (C)
2. Development of wire rod with high temperature super conductivity (C)
3. Clarification of influenza virus infection process and its application (C)
4. Ultra-high speed peta-byte information storage (C)
5. Ultra-violet emission laser diode development (C)
6. Creation of nano-sheets (C)
7. Development of tissue regeneration technology from cells controlled by nano-level surface controlled cell (C)
8. Creation of self assembled molecule system and chemical translation of bodily function (E)
9. Transparent metal and transparent semi-conductor (E)
10. Discovery of new type of super-conductive material (E)
11. Development of solvent free chemical process (E)
12. Development of plastic optical fiber and highly functional plastic (E)
13. Development of ultra-high capacity hard disc (P)



## **Some consideration on counterfactuals of each program**

- ✓ **Counterfactuals of each program is not clearly examined qualitatively.**
- ✓ **However symposiums, workshops and questionnaire survey are arranged every year to introduce and to analyze achievements of each program.**
- ✓ **Analyzing comments and behaviors of audiences, journalisms and respondents, some information of outcome and/or impact is obtained.**
- ✓ **In addition, some information of counterfactuals is also obtained.**
- ✓ **For instance, if results of above mentioned analysis is positive, it will be indirect and inside out counterfactuals.**
- ✓ **This type of analysis could be used to evaluate outcomes and impacts as well as counterfactuals indirectly.**

**Thank you for your kind attention.**