

Impact evaluation of R&D support for SMEs and startups and its feedback on project management

5 November 2018

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NEDO's support for SMEs

Evaluation system in NEDO

Impact evaluation of R&D support for SMEs

- 1) Commercialization rate
- 2) Success / Failure factors
- 3) Effects on the participating SMEs

Conclusions

NEDO's support for SMEs

What's NEDO

NEDO plays an important role in Japan's economic and industrial policies as one of the largest public research and development management organizations. It has the two basic missions of addressing energy and global environmental problems and enhancing industrial technology.

NEDO's Missions

- Solving **energy** and global **environmental** problems
- Enhancing **industrial technology**

established in 1980

Annual budget for FY2018 159.6 billion yen (1.23 billion euro)

Definition of SMEs

Capital Stock	Number of employees
Not more than 300million yen*	Not more than 300 persons

*approximately 2.3 million euro

Three pillars of NEDO's Fourth 5-Year Plan (FY2018-2022)

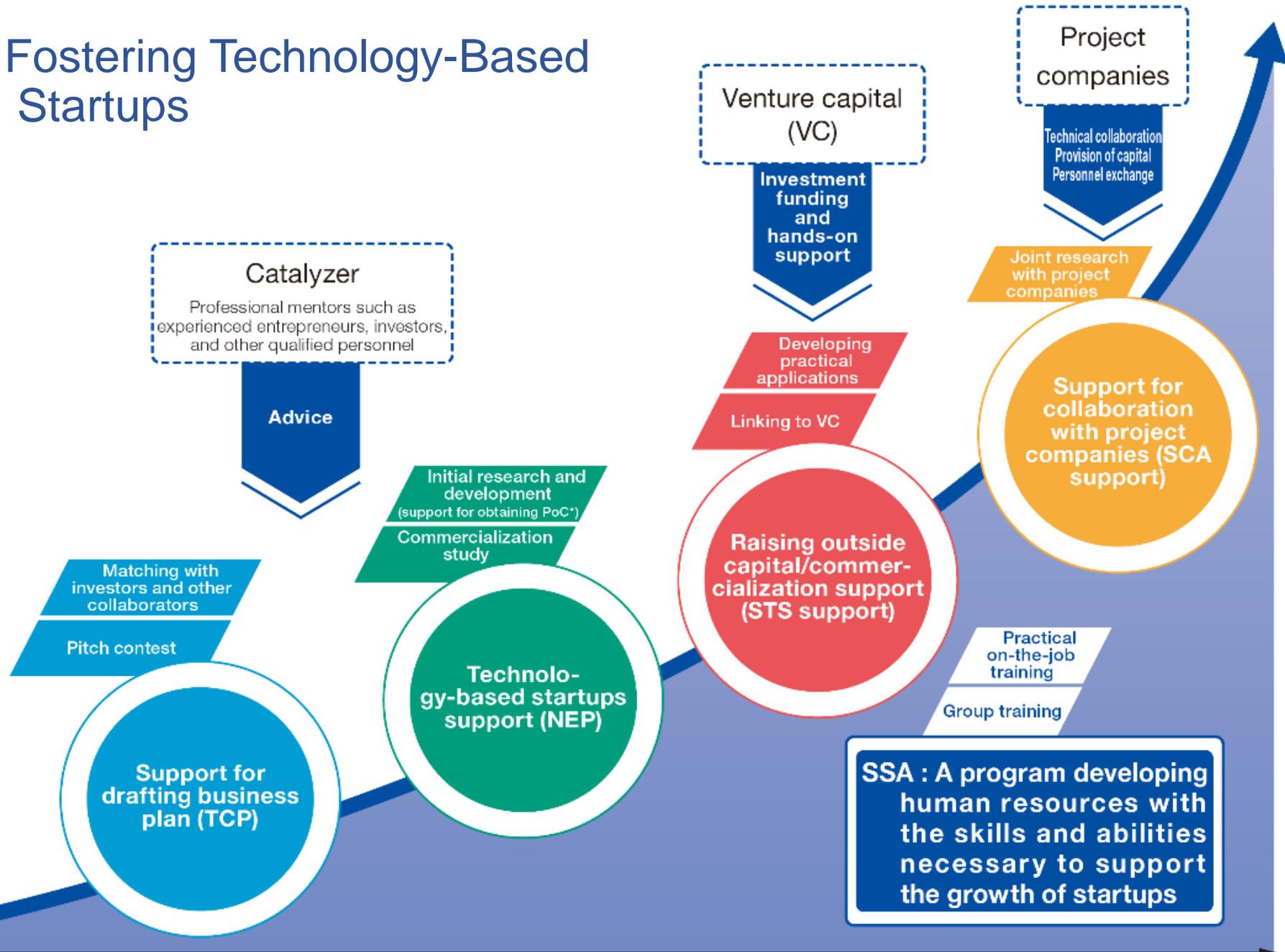
Achieving results for practical use
through technology development management

Fostering technology-based **startups**

Providing a new direction for mid- and long-term
technology development.

Fostering Technology-Based Startups

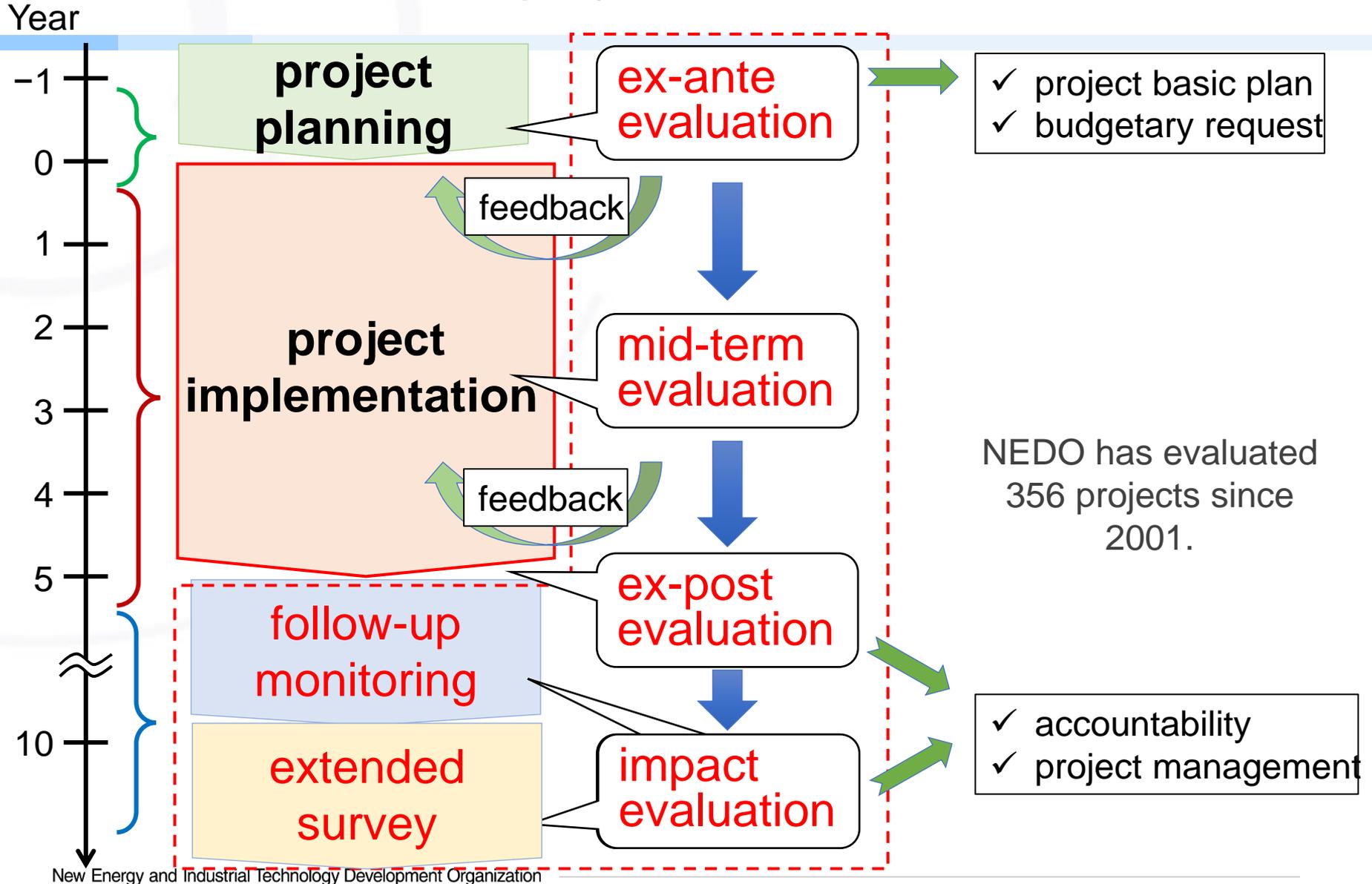
Project scale



Stage/Time

Evaluation system in NEDO

Overview of NEDO project evaluation



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Follow-up Monitoring

- When – after 1/2/4/6 years of project termination
- How: questionnaires
- (Q1) Present status of the post-project activities
 - as a 5-level stage
 - 0) unfortunately terminated (abandoned)
 - 1) elemental research, 2) technology development,
 - 3) practical application, 4) commercialized,
- (Q2) Possible factors of success or failure
(Why success / failure?)
- (Q3) How was the project management provided by NEDO?
- (Q4) Intention of participants to the project.

Success rate of SMEs

Category	Projects (Companies)	Success number	Success rate
SMEs excl. startups	445 (351)	150 (132)	33.7%
Startups	392 (293)	129 (114)	32.9%
Total SMEs	837 (644)	279 (246)	33.3%

- * “Success” = 3) already practically applied + 4) successfully commercialized
- * Success rate = number of successful projects / number of total projects

Impact evaluation of R&D support for SMEs

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The interview for this purpose consists of four parts:

(E1) Status of R&D results, practical application and commercialization

(E2) Specific activities taken by the company to achieve the results

(E3) Whether the company had enough resource to proceed those activities effectively

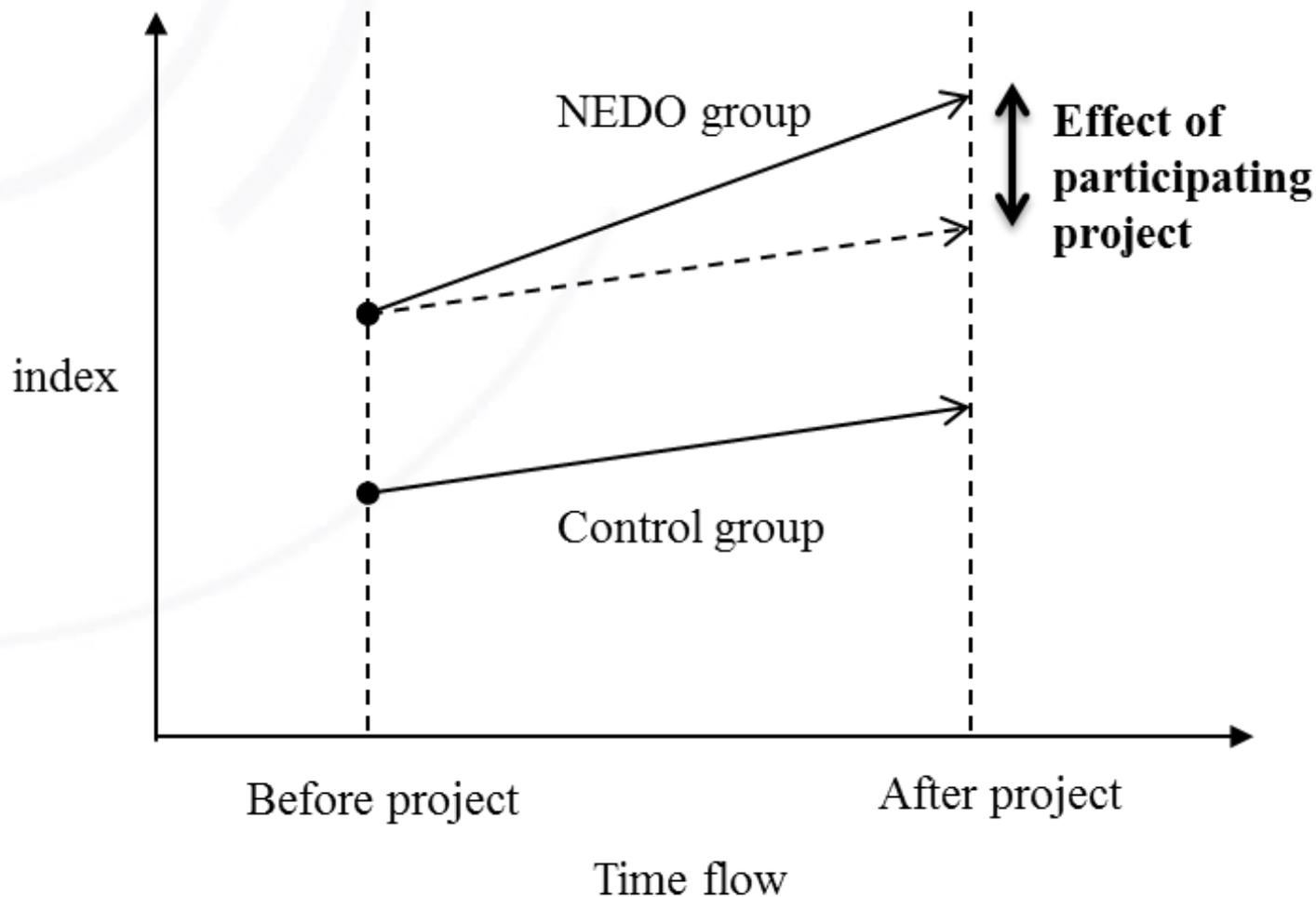
(E4) Actions taken to complement resource deficit / to make good use of present resource

- (a) Thorough ex-ante survey on the business region the company has strength: target customers, market / technology region
- (b) Securing the resources: from both inside and outside of the company, including effective sharing of the resources
- (c) Adjustment by judging the change of the environment: continuous survey and search for the output market
- (d) Continuous effort for resources: resources are continuously needed after reaching practical application stage, for manufacturing and sales activities

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Schematic diagram of the DID analysis.



Data - Average sales amount (million yen)



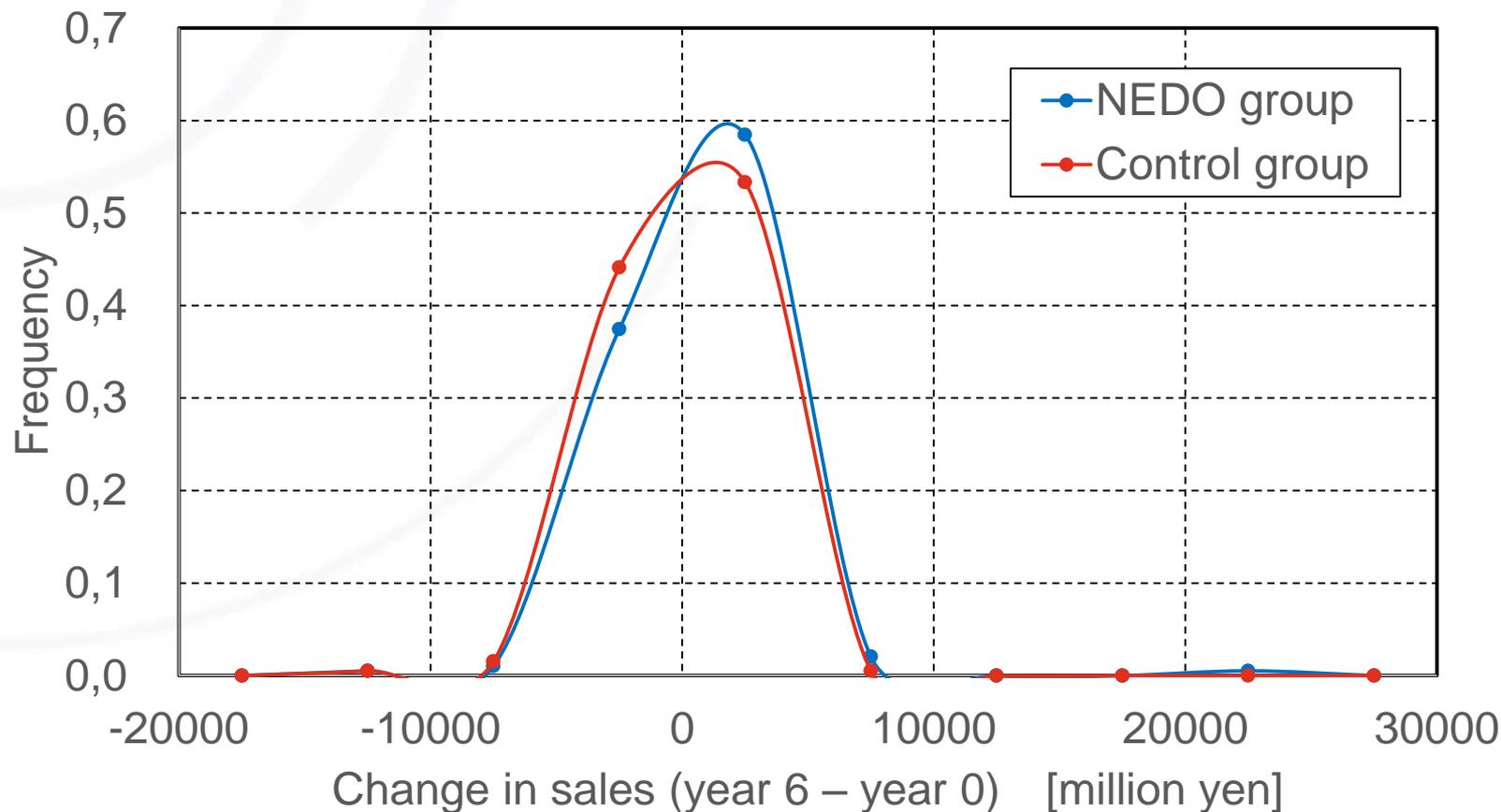
NEDO group year 0	NEDO group year 6	Control group year 0	Control group year 6
2,688	2,956	2,502	2,573

Data - Average sales increase rate

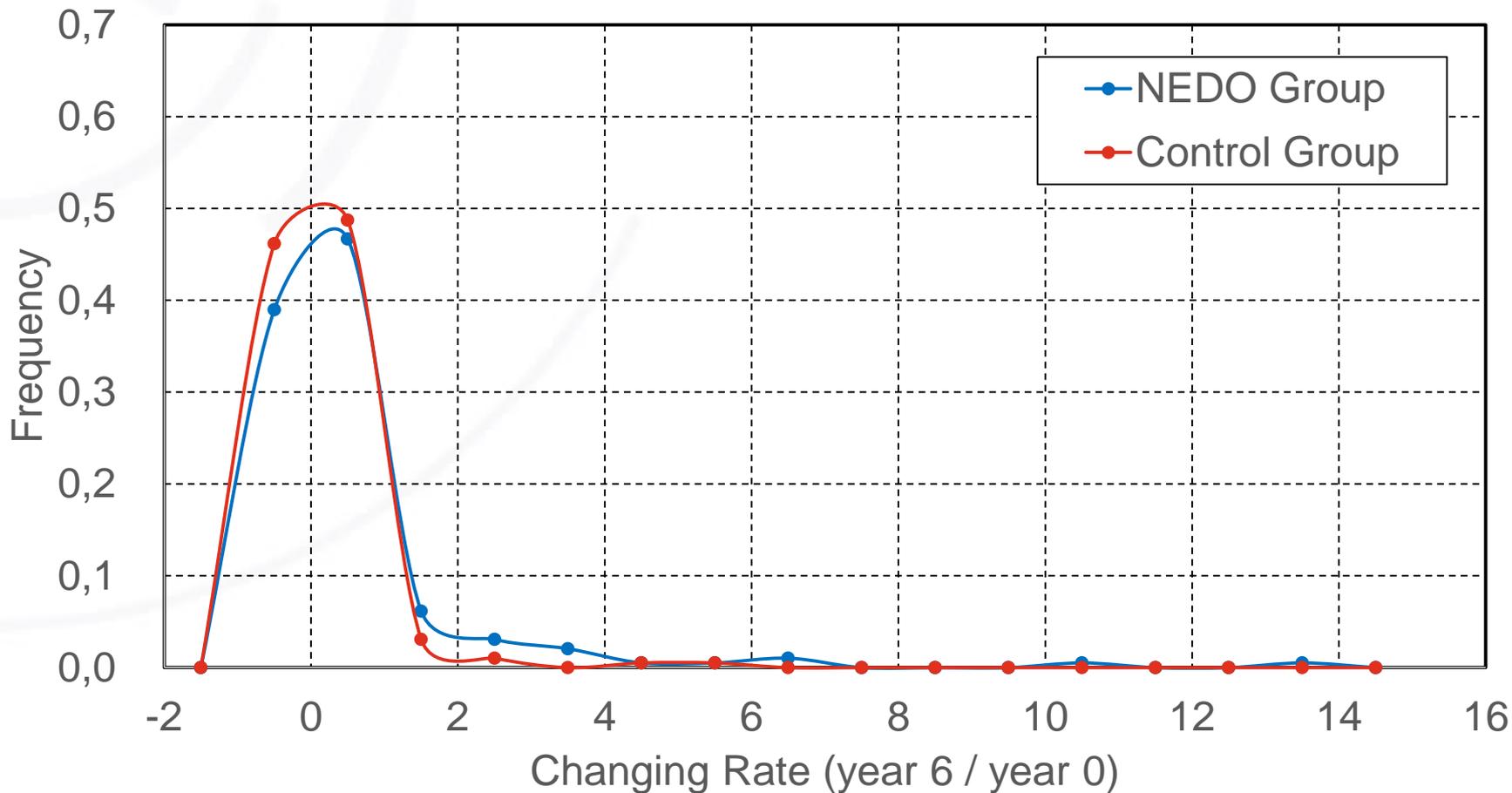


	NEDO group	Control group
Average sales increase rate between year 0 and 6	48%	12%

Distribution of Sales Amount Change



Distribution of Sales Increase Rate Change



Conclusions

The impact evaluation of NEDO's R&D support for SMEs is analysed based on follow-up monitoring and extended survey data.

The average “success” rate for SMEs was around 33% for both startups and SMEs excluding startups, which was significantly higher than the rate of large companies participating NEDO projects, around 25 %.

Interviews to “successful companies” revealed keys to success. Business environment survey together with resource securing were found to be particularly important, both in the planning stage and in the period after the application stage.

A Difference-in-differences (DID) analysis was conducted to clarify the effect of NEDO projects on participating SMEs themselves. Statistical tests revealed a difference on the average sales increase rate.