

Sustainability in ILC

New SRF Facility at KEK for Mass-Production Study
in Collaboration with Industries

Takayuki SAEKI

KEK, 1-1 Oho, Tsukuba, Ibaraki, Japan

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Abstract

The construction of the new SRF facility including new building next to the KEK-STF facility has started for mass-production study of SRF accelerators in collaboration with industries **taking into account the sustainability in ILC**. This new building has the dimension of 80 m x 30 m and the plan is to install clean-room for cavity-string assembly, cryomodule assembly facility, cryogenic system, vertical test facility, cryomodule test facility, input coupler process facility, cavity electro-polishing facility, and control-room/office-rooms in it. The purpose of this new SRF facility is to establish a close collaboration between SRF researchers and industries, to produce technology innovation in the new industry market aiming at concept of **new sustainable and ecological society in the future**.

This presentation reports the design of new SRF facility at KEK and the organization of the new collaboration between the SRF researchers and industries utilizing the new SRF facility, as well as the impact on the upcoming large-scale future SRF project, i.e. International Linear Collider (ILC).

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- New Facility at KEK for SRF Technology by the budget.
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- Plan and Road Map
- YATOYAMA concept
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New Budget was Accepted by “Ministry of Education, Culture, Sports, Science and Technology of Japan” (MEXT)

Title of new budget :

“New Project for Creating a Market for EARTH-CLEANER Products in Collaboration with Industries and Laboratories/Universities.”

Location of Organization : KEK

Director of Organization : Atsuto SUZUKI (also DG of KEK)

Collaboration with Following Industries :

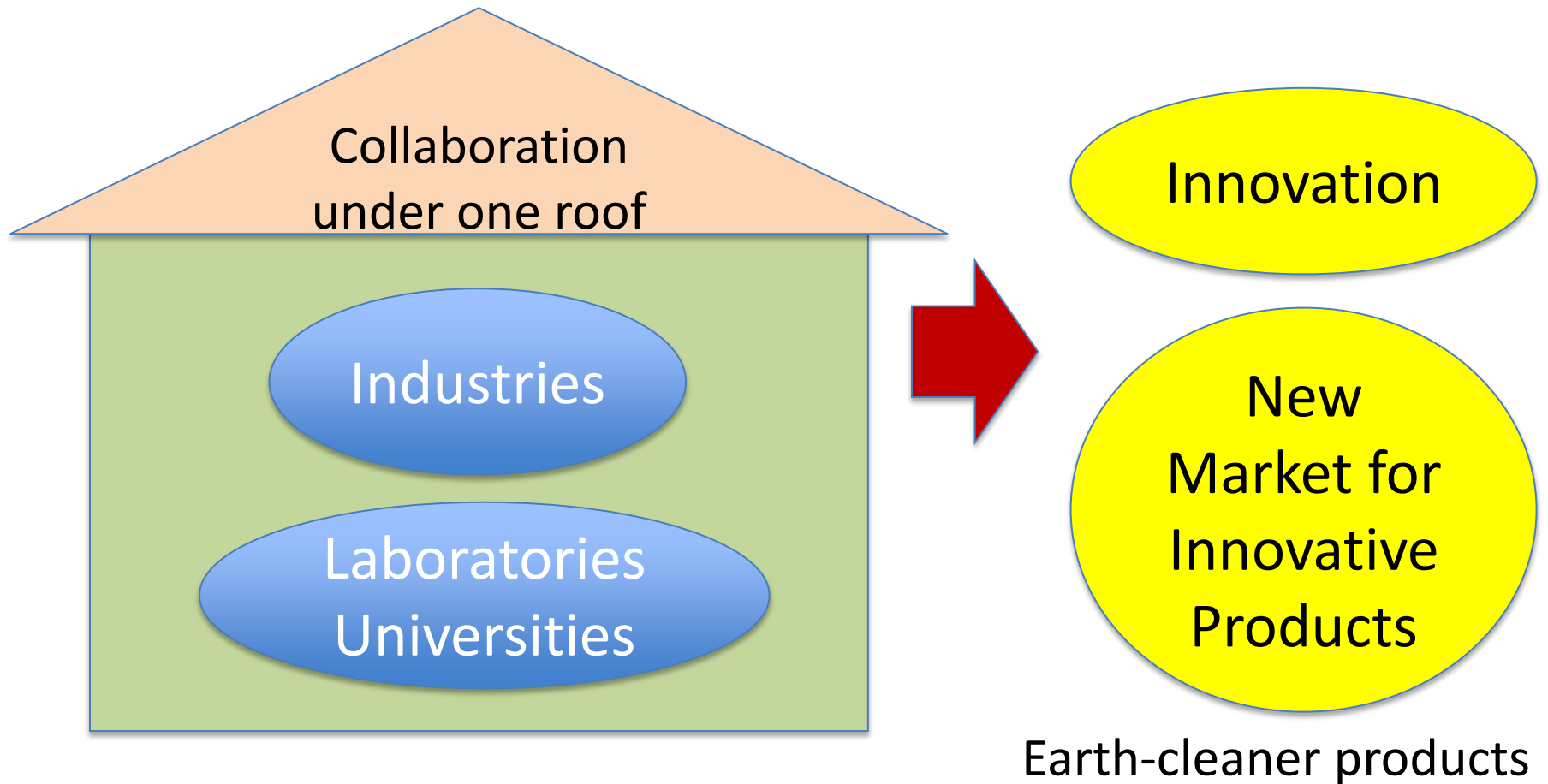
Mitsubishi Heavy Industry (MHI), Hitachi, Toshiba

Mitsubishi Electronics, Kyocera, Fujikura, Astellas

Abstract of New Budget Plan

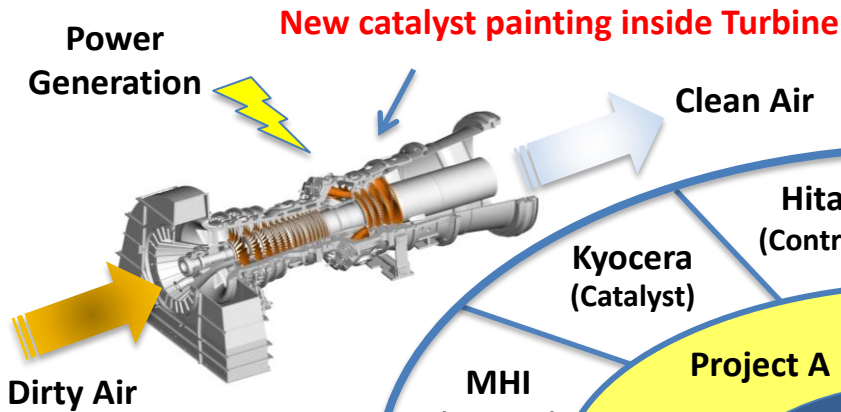
In order to keep the earth sustainable, we need to solve the serious problems such as “Pollution of the earth”, “Warming of the earth”, “Energy Crisis”, “Natural Resources Shortage”, etc. Here, the situation created the needs for “New Energy Network System”, “Integration of Power Plant and Water/Air Cleaner” and so on, which clean the environment of the earth. The new project by the budget utilize the Superconducting Accelerator and Quantum Beam Technology, and create a new market for these “EARTH CLEANER” products. Finally, the goal of the project is to challenge the realization of **global/sustainable environment on the earth.**

Expected Function of New Plan by the Budget

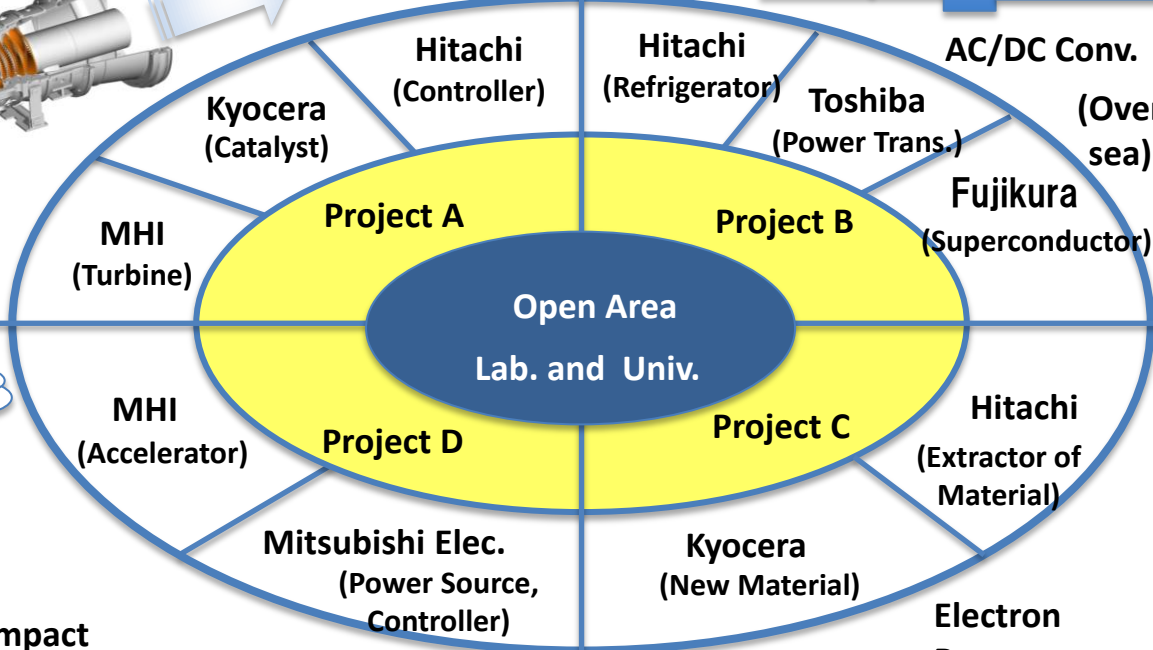
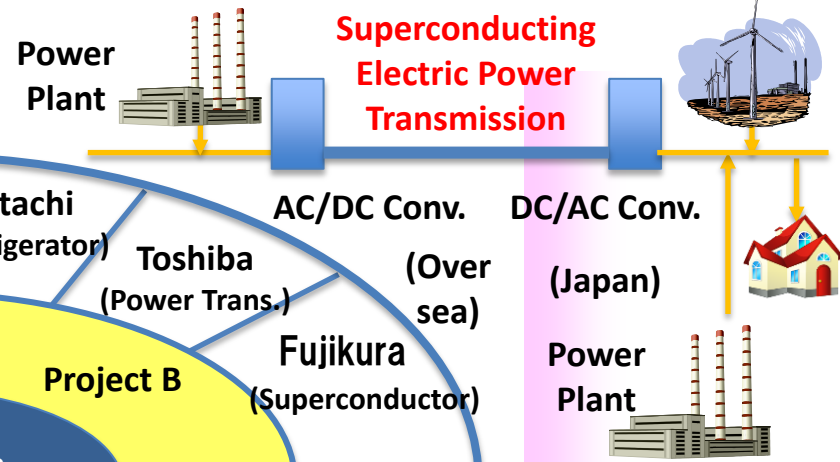


Expected Innovation from the new SRF Facility

Air Cleaner in Turbine



International Energy Network System



Hitachi (Controller)

Kyocera (Catalyst)

MHI (Turbine)

Hitachi (Refrigerator)

Toshiba (Power Trans.)

Fujikura (Superconductor)

MHI (Accelerator)

Mitsubishi Elec. (Power Source, Controller)

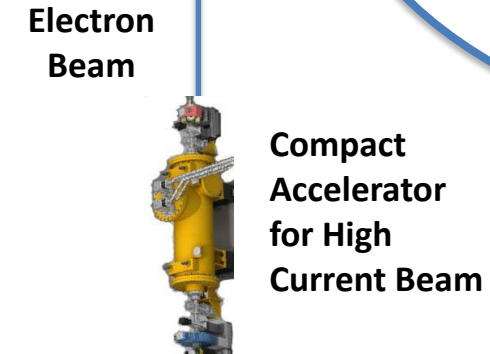
Hitachi (Extractor of Material)

Kyocera (New Material)

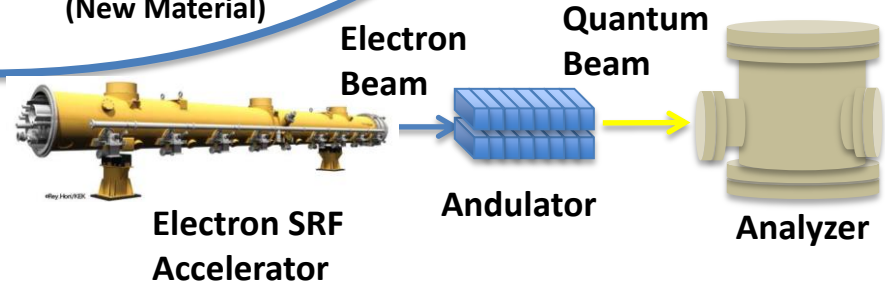
• New Material

• New Medicine

Ozone Hole



Ozone Layer Creator

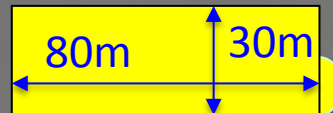


Creation of New Material and Medicine

New Facility at KEK for SRF Technology

New Industry Collaboration Area

New STF Building



FY 2013 construction

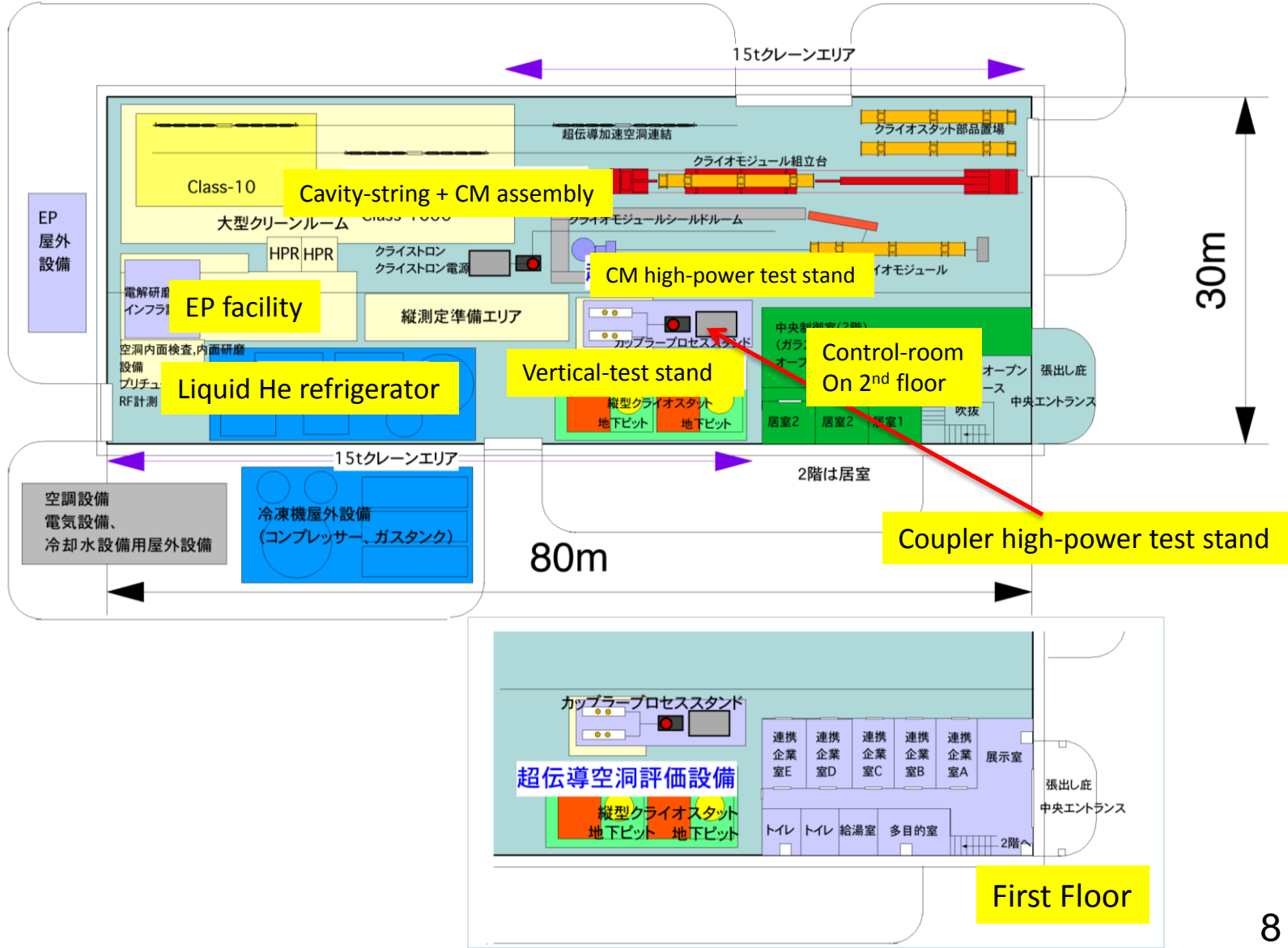
Existing
STF Building

ATF

Existing STF tunnel
to be extended

New Quantum Beam R&D Area

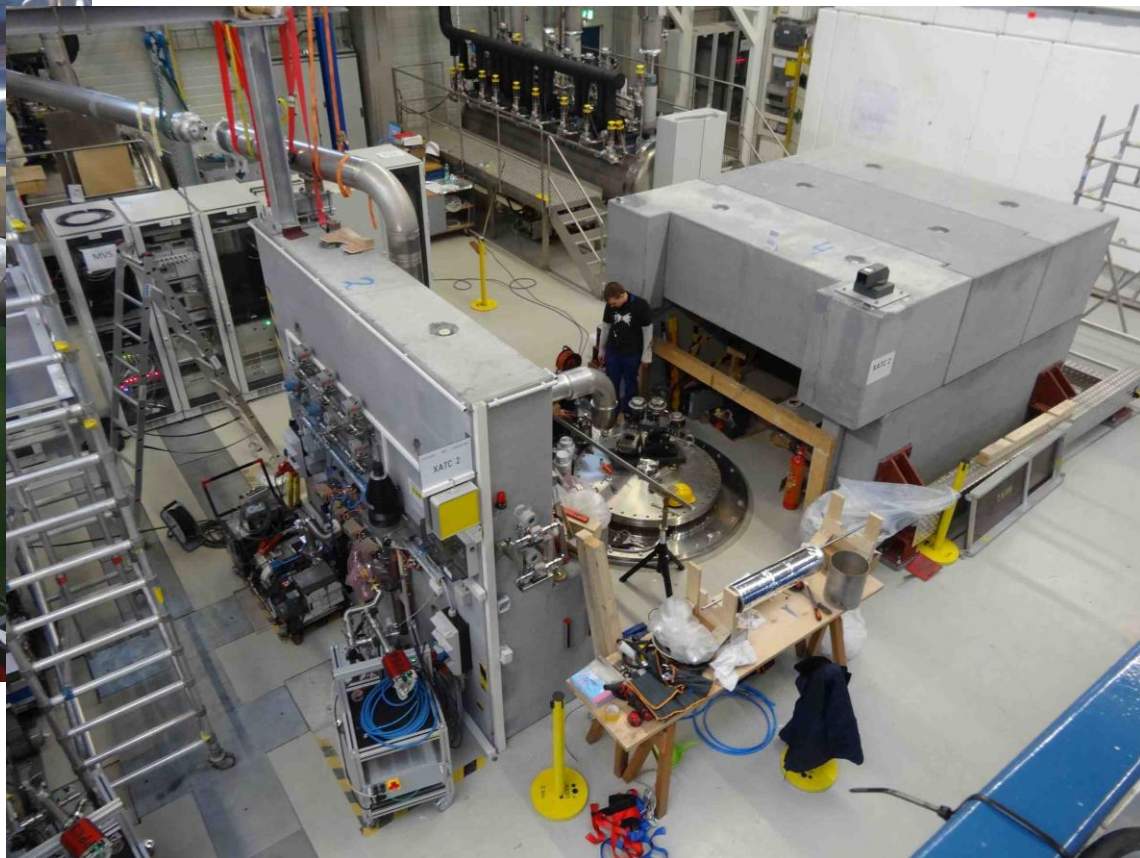
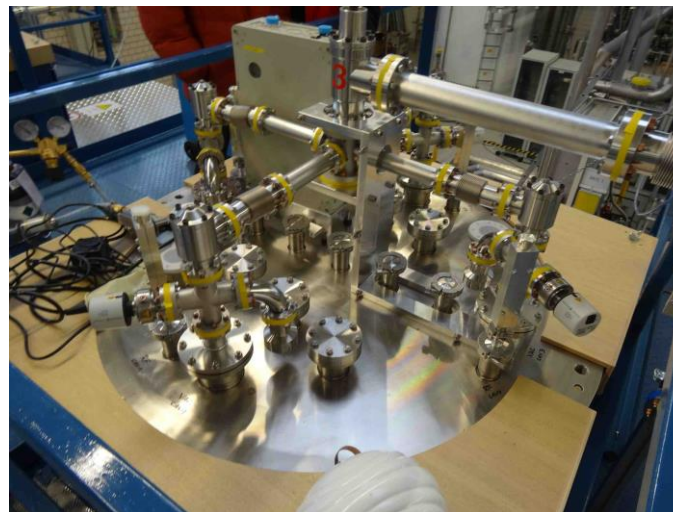
New STF Building / Equipment (Two Years Later)





Saclay Vertical-EP

Example of Vertical Test (VT) Facility at DESY



DESY AMTF

Example of Large Clean Room for Cavity-String Assembly at CEA/Saclay



ISO-4, ISO-6 CR, 2 sets of String Rails

Sacaly cryomodule assembly facility

Example of Cryomodule
Assembly Facility at CEA/Saclay



Saclay
cryomodule assembly facility

List of Equipment

Items	Specification	Numbers
Electro-Polishing (EP) Facility	For 9-Cell Cavity	1 set
Clean Room (CR)	9-Cell Cavity String	1 room
Cryomodule Assembly Facility	Nine 9-Cell Cavities	1 set
Vertical Test (VT) Cryostat	Four 9-Cell Cavities	1 set
RF Control System for VT	RF Control for VT	1 set
He Refrigerator	600W(4.4K) 250L/h	1 set

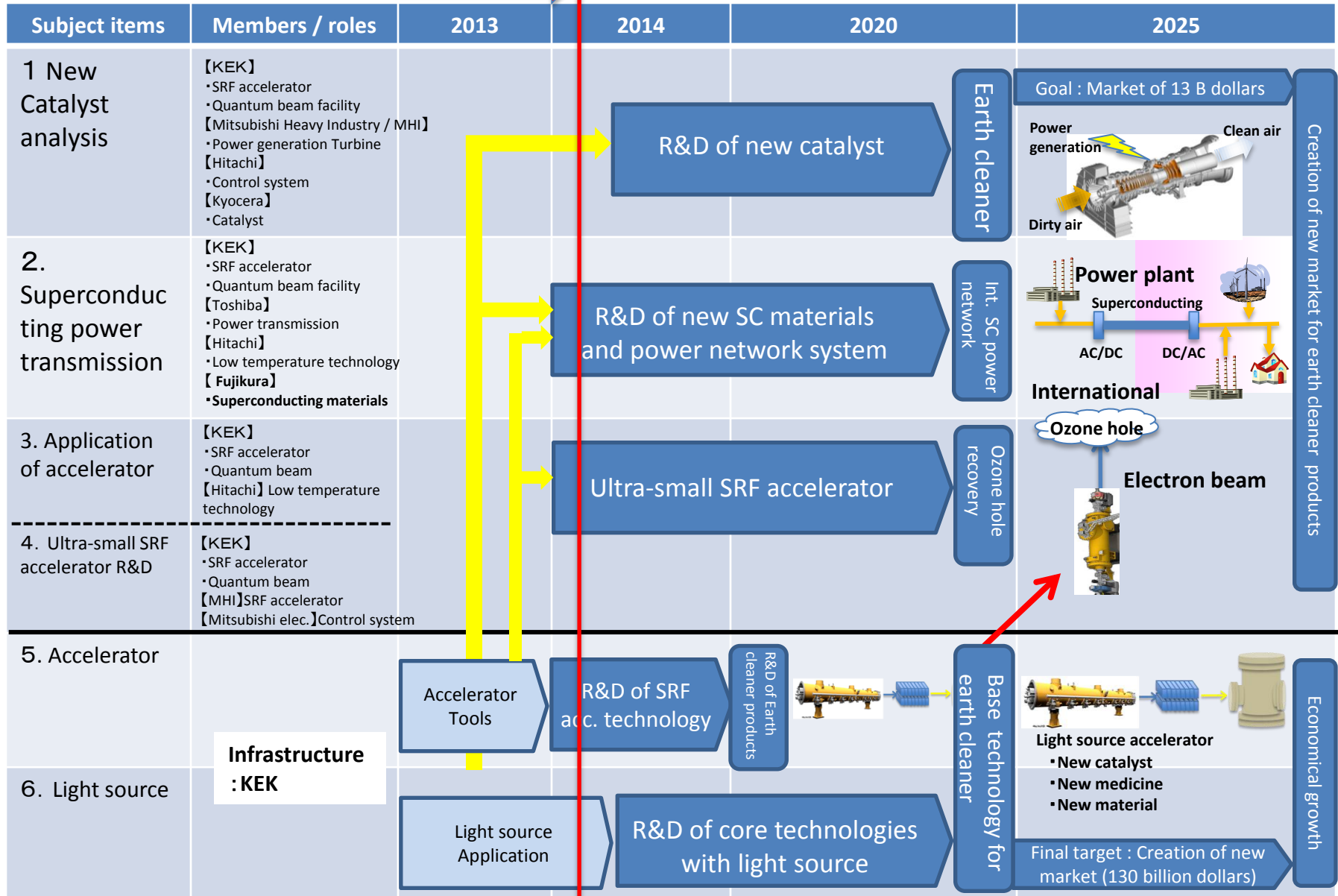
**Not included in the budget,
but planned equipment in the near future**

Items	Specification	Numbers
Cryomodule Test Facility	9-Cavity Cryomodule	1 set
Coupler Aging Stand	Stand for Two Couplers	2 sets

**Collaboration with existing facilities :
STF facility, STF accelerator and quantum-beam detectors**

Original plan and Road Map

Budget is only accepted by the end of march 2014.

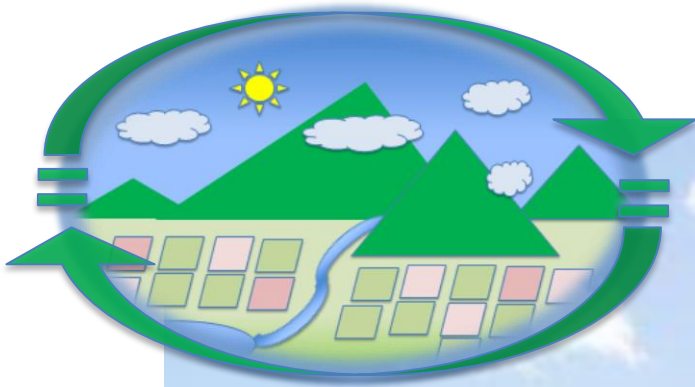


To extend the earth-cleaner program more, we considered the concept of
“new SATOYAMA model for sustainable society”.

The extended program was proposed to the MEXT last August, but it was rejected.....

We will try next application...

SATOYAMA concept



**SATOYAMA = Japanese old/small village
or its lifestyle**

**SATOYAMA concept:
Recycling all wastes in the village**



Realization of global sustainable society by new YATOYAMA model

Solution

- Function:

Personalization X

Functionalization X

(Resilience +

Sustainability +

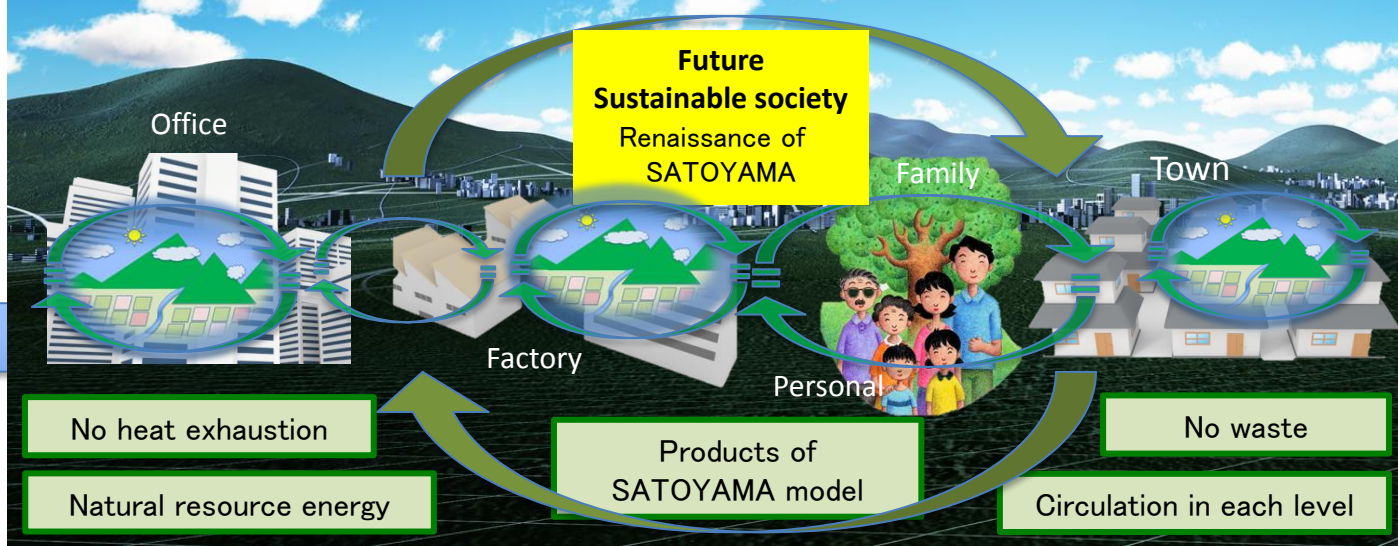
Flexibility)

- Waste

Explosion of population /
destroying environment



Limitation



Back-casting

Front-casting

Technology to utilize
bio-functions



Photo-synthesis

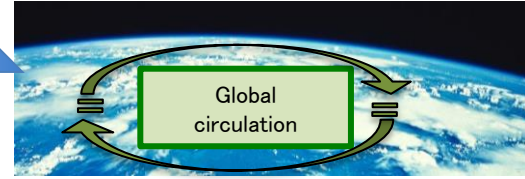
Biological
luminous
function:
firefly

Analysis of bio-function

Market of SATOYAMA products all over the society

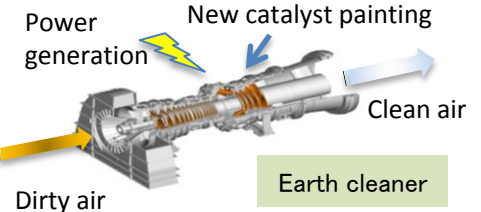
SATOYAMA products for each personal,
family, office, town, factory, and society.

Organization of all circulations in all levels of society



Earth-cleaners for global environments

- * Global earth cleaner system
- * Ozone layer creation
- * New medicines
- * International power grid



SEM

Not enough

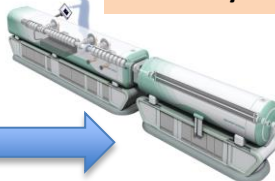


Nano technology



Huge size of light source
facility for pico-size analysis

Multi-layer SRF Acc. technology



Pico
technology

Ultra-small size light source

Summary

- New budget was accepted by “Ministry of Education, Culture, Sports, Science and Technology of Japan” (MEXT).
- Various Innovations are expected from the New Project in the Collaboration with Industries.
- New STF Building for SRF Technology will be build next to the existing STF building.
- New STF Building includes Facilities of CR, EP, He Refrigerator, Coupler aging stand, and CM assembly, with a control room.
- Plan and Road Map.
- YATOYAMA concept
- Summary