

The Status of the ILC Project in Japan

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Purpose of this document

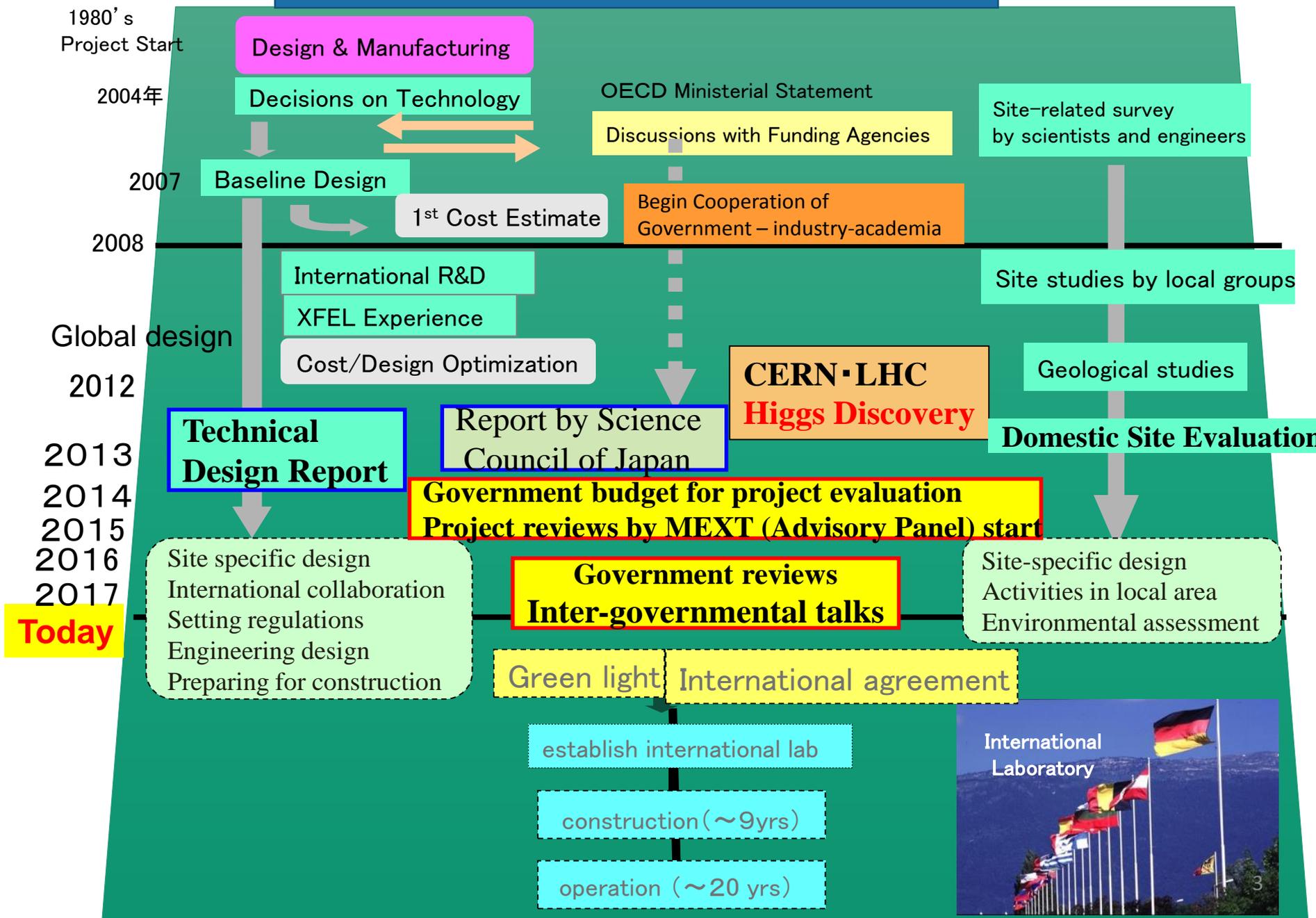
- Sharing information on developments and current status of the ILC project in Japan and in the worldwide HEP community.

DOE-MEXT discussion group and cost reduction R&D

Start of discussions on the staging scenario in the worldwide HEP community

- Providing basic information to discuss how to facilitate discussions between governments and funding agencies.

Timeline of ILC Where We Stand Now



Recent Developments on Promotion of the ILC Project in Japan

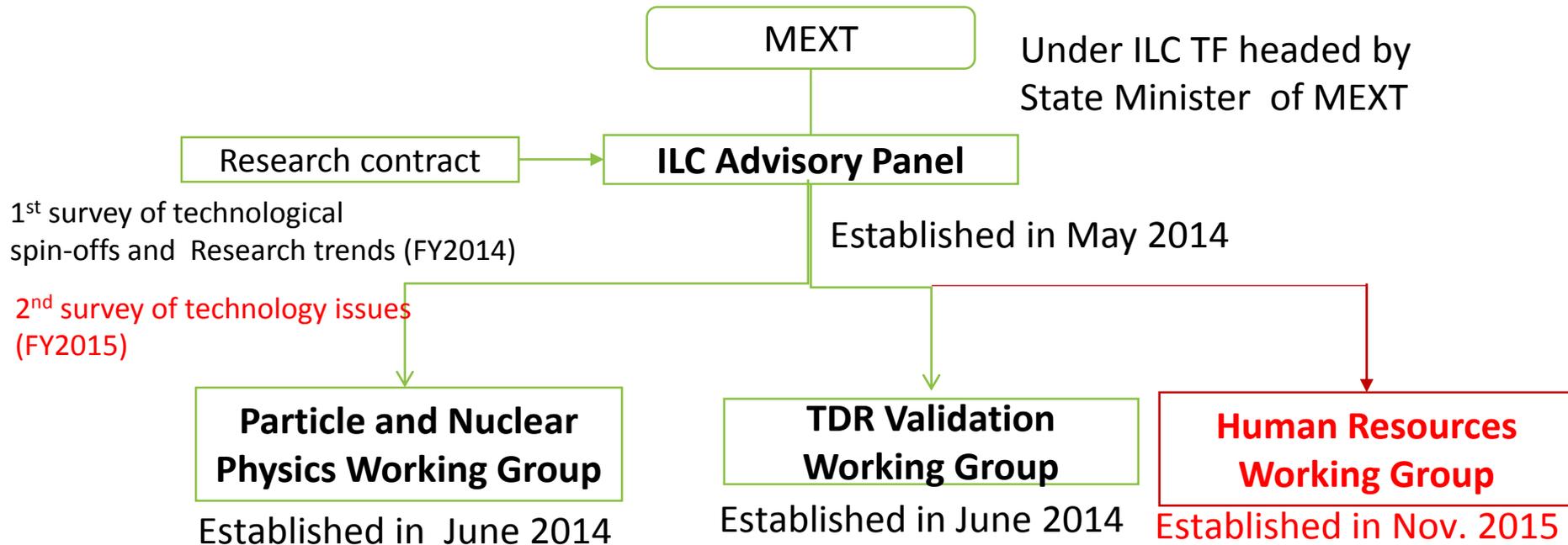
- October 2012: Japanese HEP community proposed to host the ILC in Japan as a global project. **“A Proposal for a Phased Execution of the ILC”**
- Statements on ILC hosted in Japan
 - The European Strategy for Particle Physics Update 2013
 - ACFA/AsiaHEP Statement on the ILC (September 2013)
 - P5 report (May 2014)
 - ICFA statements (January and July 2014)
- September 2013: Science Council of Japan (SCJ) sent Report on the ILC Project to MEXT.
- May 2014: MEXT set up ILC Advisory Panel.
- After the 4th meeting in June 2015, ILC Advisory Panel disclosed “Summary of ILC Advisory Panel’s Discussions to Date” in August 2015.
- In the recent meeting on February 1, 2017, the US-Japan cost reduction R&D and the HEP community’s discussion on the staging scenario were reported.

SCJ (Science Council of Japan) issued the
“Remarks on the International Linear Collider Project” (Sep.2013)

“the government of Japan should (1) secure the budget required for the investigation of various issues to determine the possibility of hosting the ILC, and (2) conduct intensive studies and discussions among stakeholders, including authorities from outside high-energy physics as well as the government bodies involved for the next two to three years.”

“ it is necessary to have discussions with the research institutes and the responsible funding authorities of key countries and regions involved outside of Japan and to obtain clear understanding of the expected sharing of the financial burden.”

ILC Advisory Panel in MEXT



- Based on SCJ's recommendations, Special Committee investigates critical issues required to judge hosting ILC.
- ILC Advisory Panel's Summary (Aug 2015)
- "Report on measures to secure and develop human resources for the ILC" (July 2016)
- A new WG to investigate organizational and management issues was recently set up (Feb 2017)

Interim Report from the ILC Panel

Summer 2015

- **Recommendation 1:** “The ILC project requires huge investment that is so huge that a single country cannot cover, thus it is indispensable to **share the cost internationally**. From the viewpoint that the huge investments in new science projects must be weighed based upon the scientific merit of the project, a clear vision **on the discovery potential of new particles as well as that of precision measurements of the Higgs boson and the top quark** has to be shown so as to **bring about novel development that goes beyond the Standard Model of the particle physics.**”
- **Recommendation 2:** “Since the specifications of the performance and the scientific achievements of the ILC are considered to be designed based on the results of LHC experiments, which are planned to be executed **through the end of 2017**, it is necessary **to closely monitor, analyze and examine the development of LHC experiments**. Furthermore, it is necessary to clarify how to solve technical issues and how **to mitigate cost risk** associated with the project.”
- **Recommendation 3:** “While presenting the total project plan, including not only the plan for the accelerator and related facilities but also the plan for other infrastructure as well as efforts pointed out in Recommendations 1 & 2, it is important to have **general understanding on the project by the public** and science communities.”

http://www.mext.go.jp/component/b_menu/shingi/toushin/__icsFiles/afieldfile/2015/08/05/1360596_3.pdf

ICFA sent the panel chair a document to clarify scientific and technical issues raised in the summary of discussions in December 2015.

Support from Diet members and industrial sector in Japan

- Federation of Diet Members for the ILC (since 2008, more than 150 members)
- Advanced Accelerator Association Promoting Science & Technology (AAA) (since 2008, 100 companies and 40 universities and research institutions)
- Event in Washington DC on February 2016 coordinated by Hudson Institute and AAA.

4th US visit to Washington by Diet members in February 2016 with a MEXT official.



Feb 11, 2016, Rayburn House, Office Building



ILC Tokyo Event on April 22, hosted by AAA and LCC 2015 during ALCWS 2015

MEXT-DOE Discussion Group

- ✓ After the 4th visit by Japanese Diet members to Washington in February 2016, a follow-up meeting was set up between DOE and MEXT.
- ✓ High level officers from MEXT visited their counterpart in DOE at the end of May, and it was agreed to start the US-Japan discussion group co-chaired by Director, Office of Science, DOE and a corresponding level of officer at MEXT.
- ✓ Agenda of the discussion
 - ▶ Issues to be cleared
 - ▶ Possibilities of **collaborative research for cost reduction**
 - ▶ ... etc.
- ✓ Meetings will be held every 2-3 months.

[MEXT-DOE meeting on August 8, 2016 during ICHEP 2016](#)

- ✓ KEK-DG and FNAL Director were invited to the meeting to propose cooperative R&D for cost reduction.

[2nd MEXT-DOE Discussion Group Meeting in October, 2016](#)

- ✓ MEXT and DOE agreed to start collaborative research for ILC cost reduction.

US-Japan cooperative R&D for ILC cost reduction

We can use the existing framework of the US-Japan cooperation in HEP which started in 1979.

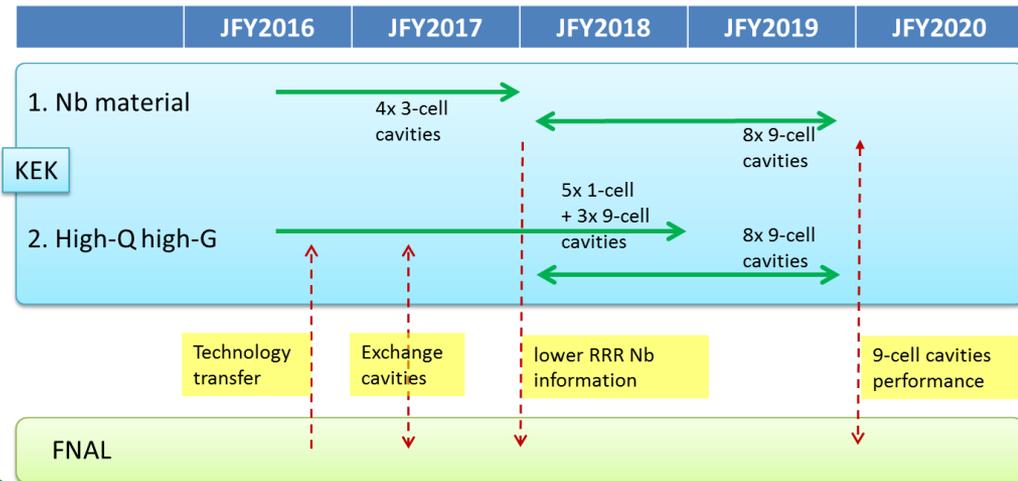
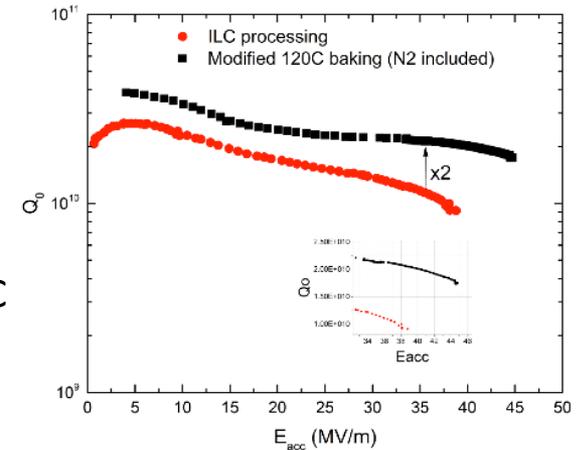


Singing of a new Project Arrangement concerning HEP between DOE and KEK, October 2015 at US embassy in Tokyo

Plan of cooperative R&D

(Anna Grassellino surface treatment)

1. Cost reduction in Nb material preparation
 2. High-Q high-gradient SRC with nitrogen infusion
- Aim to 10-12 % reduction of the ILC total accelerator construction cost.



US-Japan cost reduction R&D was reported at FALC meeting in Aug 2016 and the ILC Advisory Panel in MEXT in Feb 2017.

Discussion on a staging scenario of the ILC

- In LCWS 2016, Morioka, November 2016, we agreed to start considering a staging scenario of the ILC seriously.

Reduce the initial construction cost significantly.

Focus on the Higgs Factory first.

Take advantage of “Linear Machine” that has a flexible energy extendibility.

- LCB/LCC will work on a possible scenario of ILC staging to build consensus among the worldwide HEP community.

Initial energy and a staging scenario

Cost

Impacts on physics

Discussion on the staging scenario by the worldwide HEP community was reported at the ILC Advisory Panel in MEXT in Feb 2017.

On-going efforts in/with Europe

- A new ILC Director Shin Michizono (also ILC R&D project leader at KEK) under LCC Director Lyn Evans has start talking with European institutes to coordinate R&D and design efforts in/with Europe.
- Following the release of the KEK-ILC Action Plan in January, we agreed with European colleagues to produce “European Action Plan (EAP) for the ILC ,” which describe a European plan for the next phase assuming (Green Light in Japan) in spring 2017. This will be also an important input to the discussion for the next European Strategy.
- Two Diet members and Mr. Takashi Nishioka, President of AAA and Former CEO of Mitsubishi Heavy Industries, visited Strasbourg to attend the Grand Opening Ceremony and the VIP session of the 2016 IEEE NSS/MIC Symposium on October 31, 2016. This was a good opportunity to inform wider audience than the HEP community of the ILC project. (Discussion on how to approach the ESFRI process)

Recent Progress in the political/governmental sector

June 2016 -

- **US-Japan joint discussion group**: cost reduction study started
- **Progress in Europe & Asia**: political interactions
 - **Spain-Japan** (May-Jun.): Industry-Industry interaction, MoU between INEUSTAR and AAA
 - **Germany-Japan** (Oct): parliamentary member interactions@Tokyo

Direct discussion for ILC between German Parliament Member and JP Diet members

- **Europe-Japan & France-Japan** (Oct.): parliament & industry members interactions, IEEE@Strasbourg → create an entrance window to EU / France politics
- **India-Japan** (Oct.): Parliamentary member interactions, IPU@Geneva, Inter-University organization in formation (Japan: A. Suzuki)

Summary of the Status of the ILC

- MEXT-level investigation in Japan for ILC is being carried out, following the recommendation of the Science Council of Japan.
- ILC Advisory Panel's Summary implies that discussions with foreign countries at the government level is indispensable and that LHC results (~ 2017) should be monitored closely and taken into account.
- Federation of Diet members for ILC, industries (AAA), and local governments strongly support ILC.
- MEXT and DOE set up a "Discussion Group" and decided to start cooperative ILC cost reduction R&D.
- Governmental discussions will be expanded to Europe and Asia.
- Discussion on a staging scenario has started in the HEP community and it was reported to the ILC Advisory Panel.
- Voices from physicists' side are essential for pushing government decisions.

Buck up

LCWS 2016, Morioka, December 5-9, 2016

<http://lcws2016.sgk.iwate-u.ac.jp/Welcome.html>

The number of the participants is over 300.

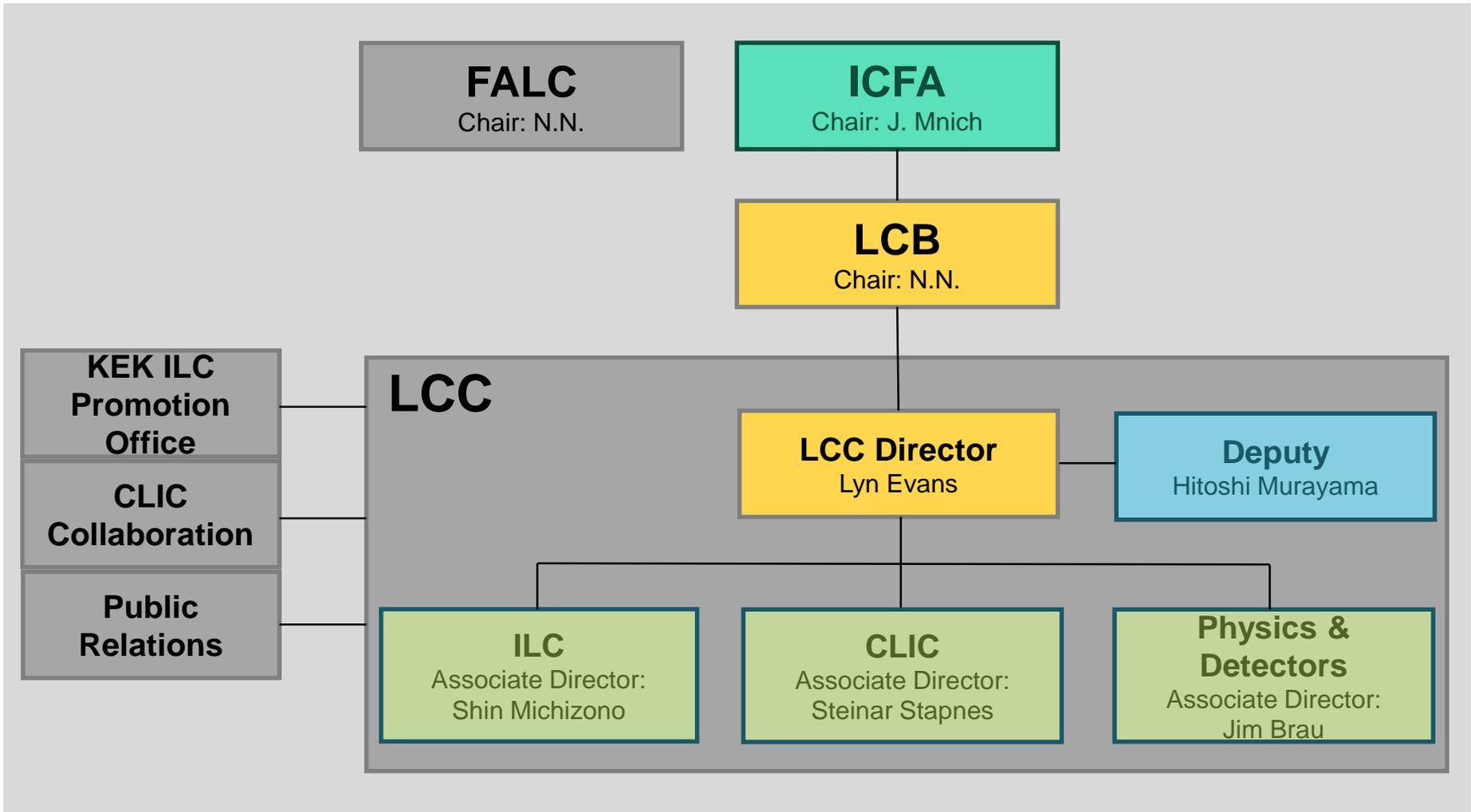
The speech by Hon. Takeo Kawamura, Chair of Federation of Diet Members for the ILC, was very encouraging : "SCIENCE FIRST".



Visit to Ohara Civic Center in Ichinoseki city

LC structure in ICFA

ICFA decided to continue the LC structure beyond 2016 at the meeting in February, 2016. The new LC structure was approved at the meeting in August 2016, and the LCC directorate was announced at LCWS 2016 in Morioka in December 2016.

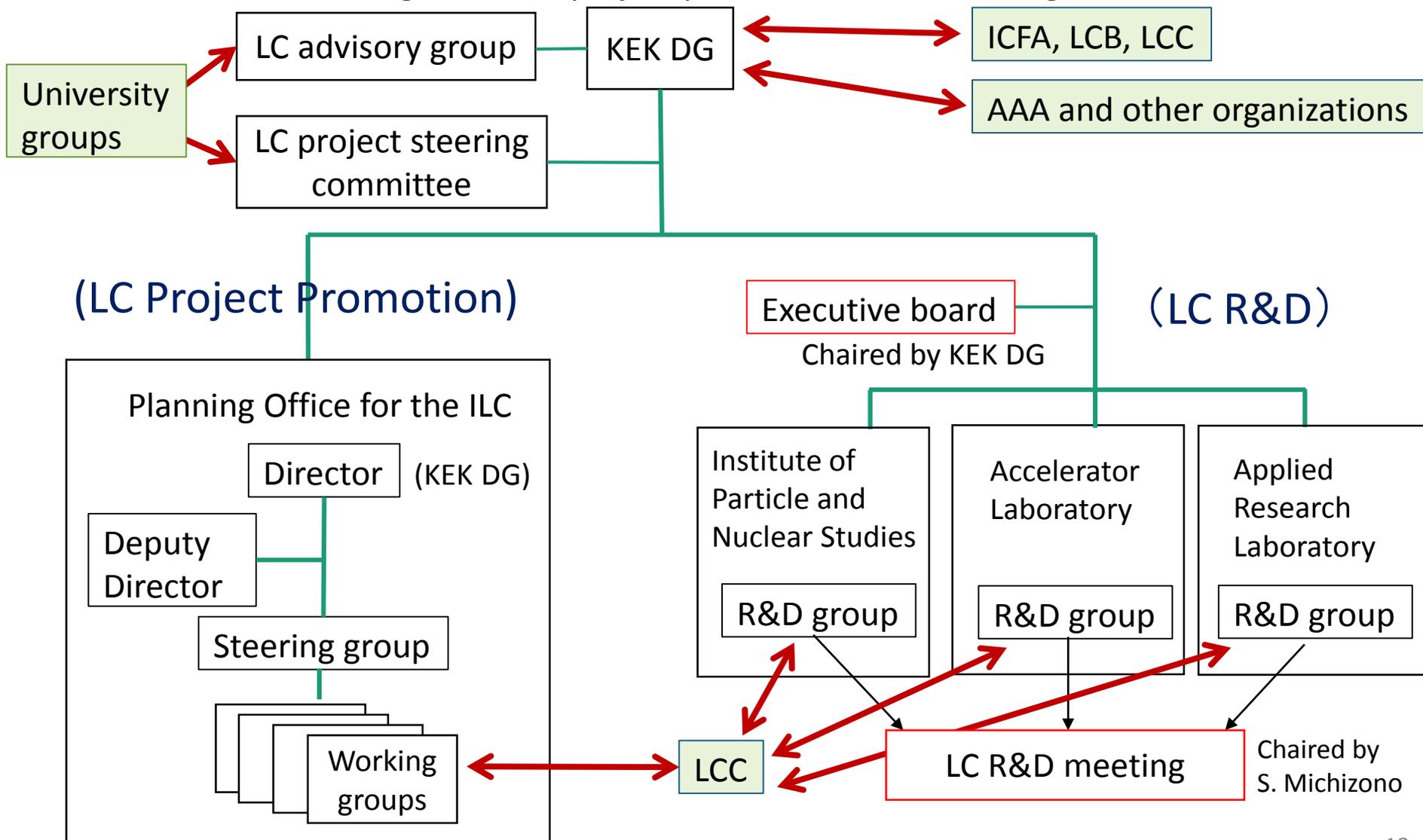


Reformation of ILC R&D and project promotion at KEK

KEK has reformulated the ILC project structure this year.

April 2016 -

This allows us to strengthen both project promotion and technological R&D.



KEK-ILC Action Plan

- ✓ KEK-DG Yamauchi set up a WG to develop a KEK-ILC action plan in May, 2015.
- ✓ KEK-ILC Action Plan was released in January 2016. It contains technical preparation tasks and a human resource development plan for the pre-preparation phase (current efforts) and the main-preparation phase (after “green sign” from MEXT). It focuses mainly on a development plan for KEK.
- ✓ This plan is intended to be a starting point to develop a further practical plan based on wider discussions.

Table 3. Human resources required during the ILC accelerator preparation (FTE) ¹⁾

	Pre-P. ²⁾	Main Preparation ³⁾				Construction ⁴⁾		Notes
	(present)	P1	P2	P3	P4	C1	C2	
Acc: JP	42	54	74	98	122	172	530	JP: needs to mature SRF mass-prod. technology ⁵⁾ EU/US: already has experience ⁶⁾
: abroad	≥ 20	28	41	65	89			
CFS: JP	3	11	11	13	17	52	53	JP: is primarily responsible, w/ outsourcing abroad: professional contribution
: abroad	1	3	5	5	5			
Comm: JP	2	7	10	13	14	109	109	JP: is primarily responsible abroad: professional contribution ⁷⁾
: abroad	1	3	4	6	7			
Admin: JP	5	8	10	14	18	77	230	JP: is primarily responsible abroad: professional and regional contribution ⁸⁾
: abroad	3	4	6	8	10			
Sum	≥ 77	118	161	222	282	410	922	
Additional comments								

http://www.kek.jp/en/NewsRoom/Release/KEK-ILC_ActionPlan_160106-EN.pdf

Federation of Diet Members for ILC

- Since 2006 in LDP, since 2008 non-partisan
- Currently about 150 members
- Frequent meetings (almost every month)



AAA (Advanced Accelerator Association)

- Established 2008. Collab between industries and academies
- 100 companies, 40 universities and institutions,
- <http://aaa-sentan.org>
- Frequent meetings and symposiums
- Held Tokyo Event (with LCC) in Apr.2015
 - At Univ. of Tokyo and Hotel New Otani
 - Diet members, ambassadors/diplomats from many countries, leading scientists



Japan-US Discussions at the Political Level

- April 30 2013 at Washington DC: Symposium on Advanced Science and Technology centered on the ILC
 - MEXT Minister, Secretary of Energy US, Federation of Diet members of Japan for ILC
- January 2014, MEXT Minister met with Dr. Monitz (Secretary of Energy) at Washington DC
- July 2014, Federation of Diet members visited Washington
- Apr. 2015, Federation of Diet members visited Washington
- Feb. 2016, Federation of Diet members visited Washington and held US-Japan Political Leader's Forum on Advanced Science and Technology.

1st US Visit by federation of Diet Members of Japan for ILC



2nd US Visit by Federation of Diet Members



3rd US Visit by Federation of Diet members

