



# ILC Status: General

Yasuhiro Okada, Executive Director, KEK

2014 Joint Workshop of the TYL/FJPPL & FKPPPL  
Particle Physics Laboratories

May 27, 2014, Bordeaux, France

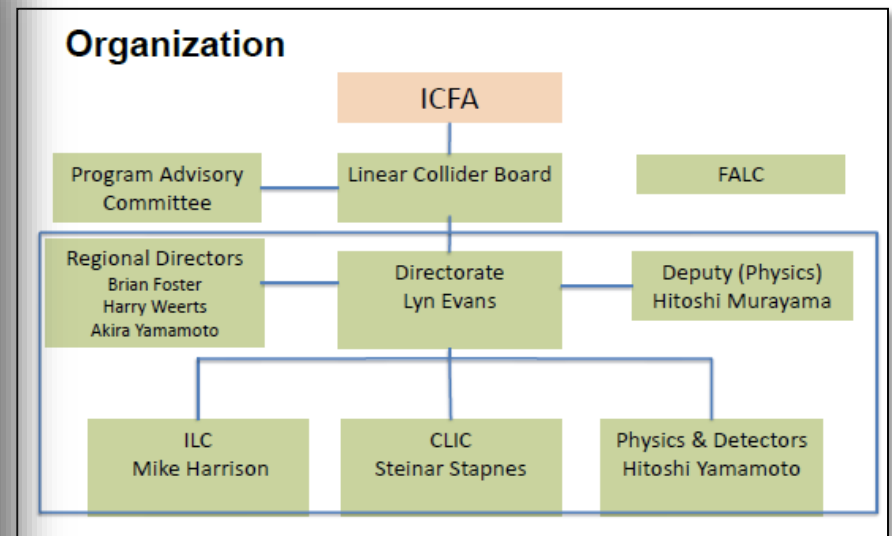
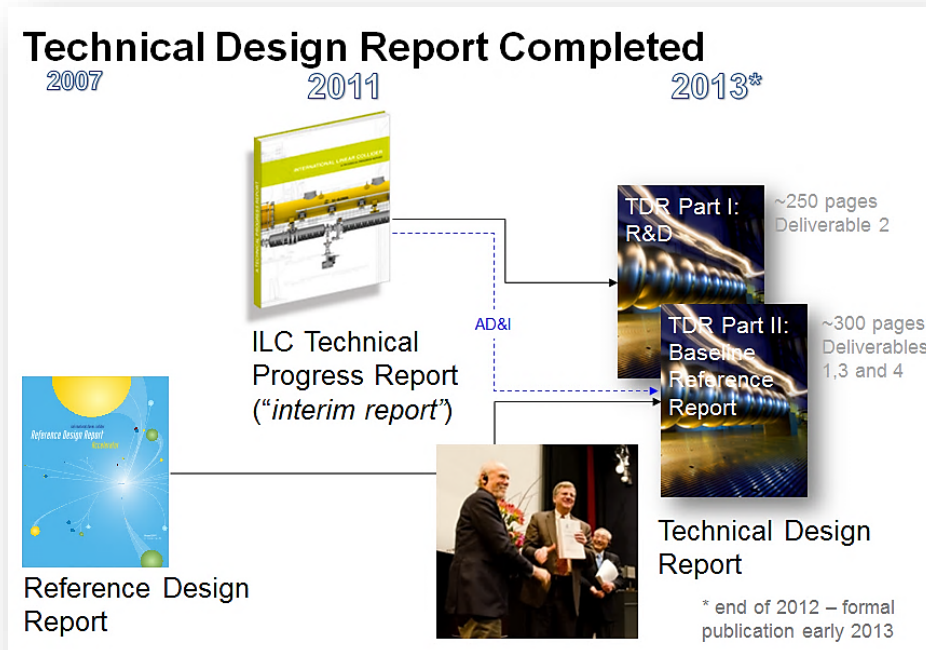
# ILC as a Global Project

- R&D for a future e+e- linear collider was started more than 20 years ago in three regions.
- By early 2000's , it became a consensus among the world HEP community that an e+e- linear collider with the CM energy of about 500 GeV should be the next collider beyond the LHC.
- ICFA chose the cold technology for LC as a global project, and set up a global team (GDE) for design and coordination of R&D for the ILC.

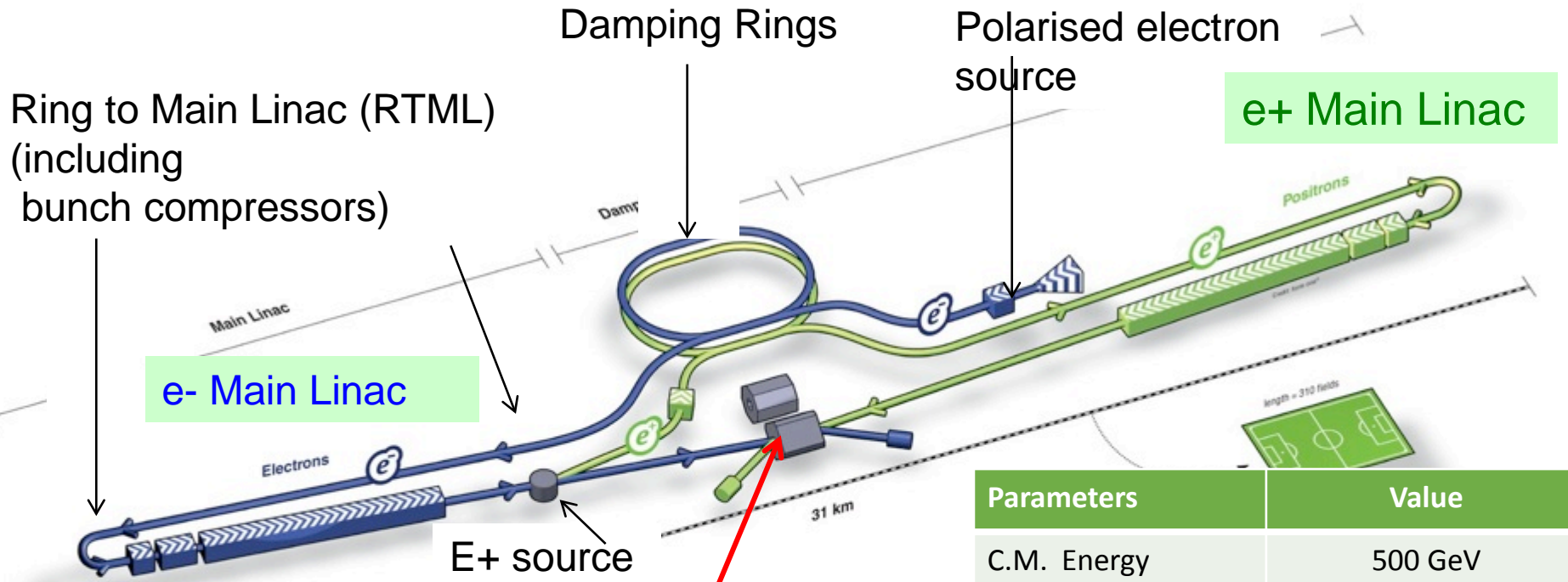


# TDR completed: The LCC succeeded the GDE

- After eight years of works, the TDR of the ILC was published in June 2013 under the leadership of the GDE Director, Barry Barish.
- ICFA set up the Linear Collider Collaboration headed by Lyn Evans.



# ILC TDR Layout



Ring to Main Linac (RTML)  
(including bunch compressors)

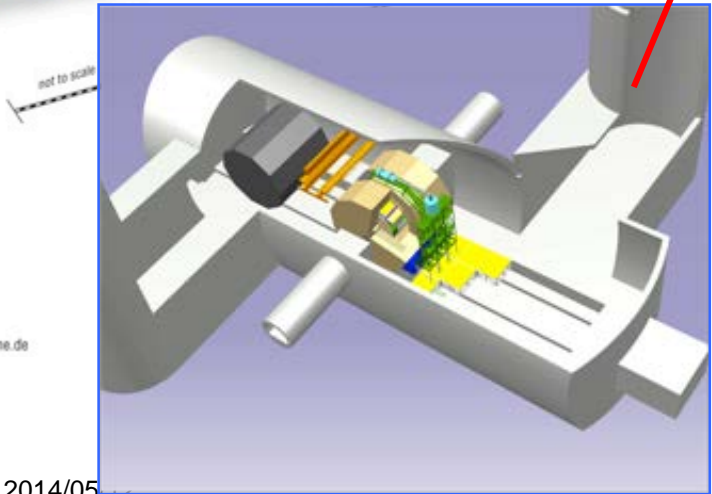
e- Main Linac

e+ Main Linac

Damping Rings

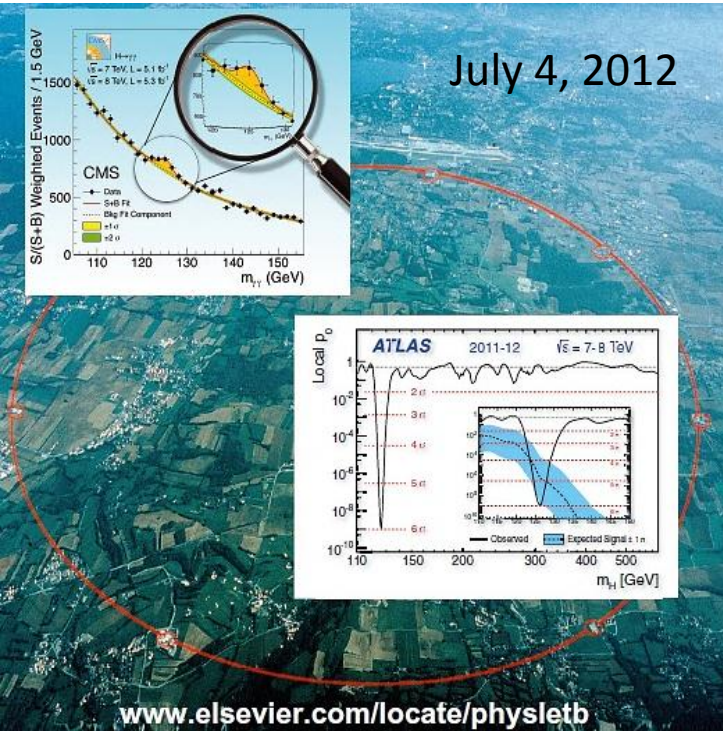
Polarised electron source

E+ source



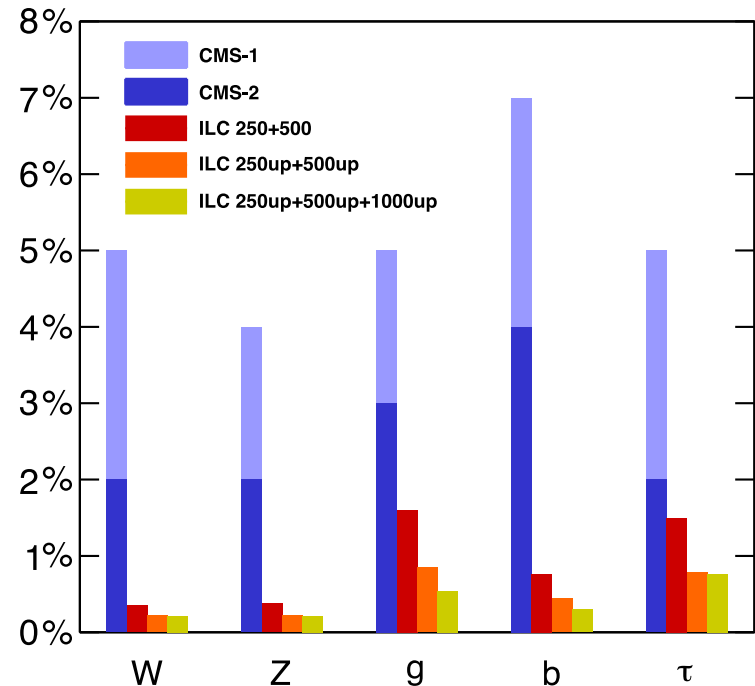
Parameters	Value
C.M. Energy	500 GeV
Peak luminosity	$1.8 \times 10^{34} \text{ cm}^{-2}\text{s}^{-1}$
Beam Rep. rate	5 Hz
Pulse duration	0.73 ms
Average current	5.8 mA (in pulse)
E gradient in SCRF acc. cavity	31.5 MV/m +/-20% $Q_0 = 1E10$

# ILC Physics case is even stronger after the discovery of a Higgs particle



The Higgs particle becomes a tool to explore New Physics.

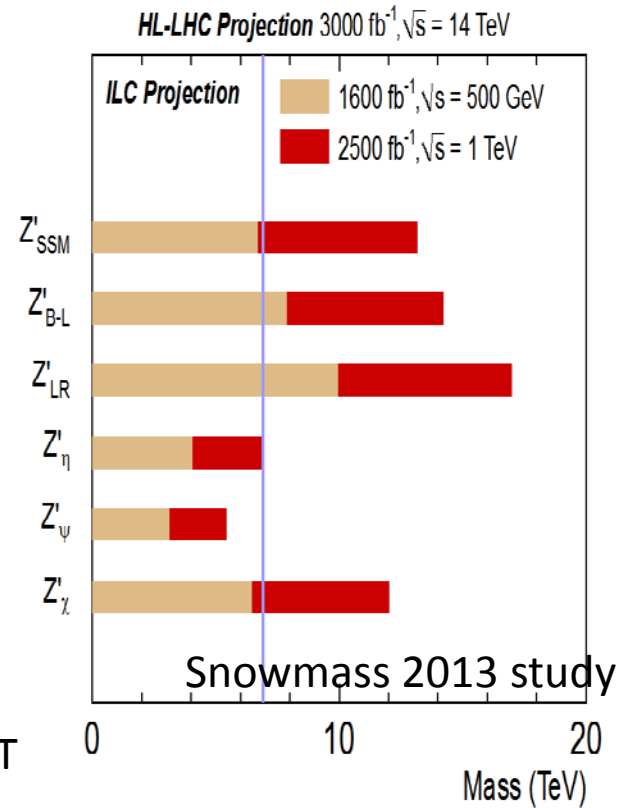
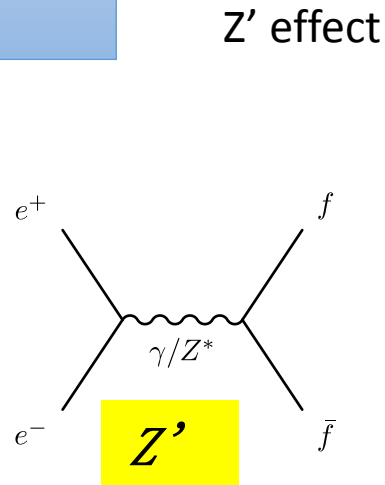
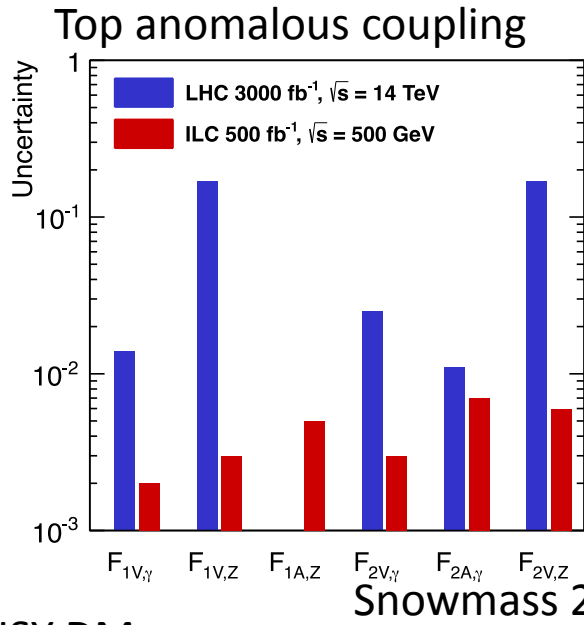
Expected precision of the Higgs coupling determination



Results taken from Snowmass 2013 study

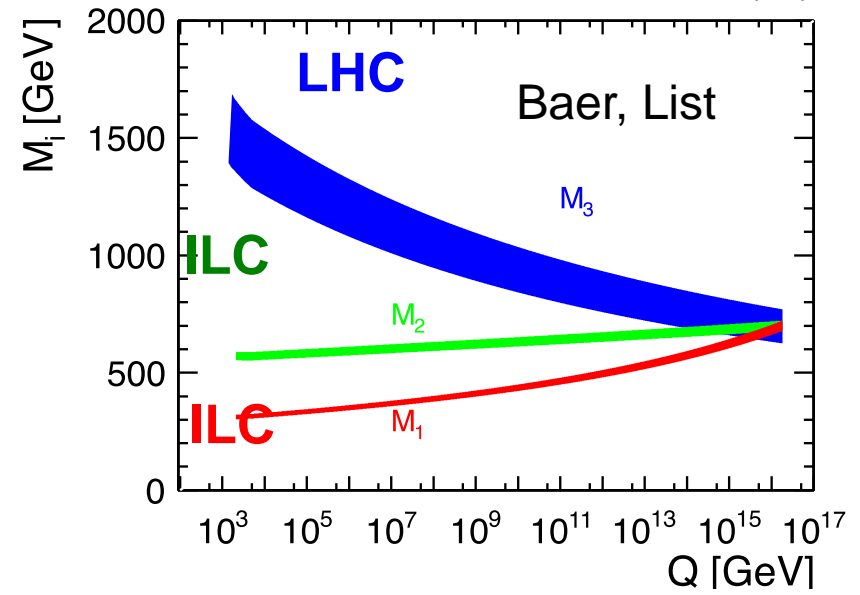
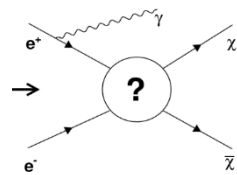
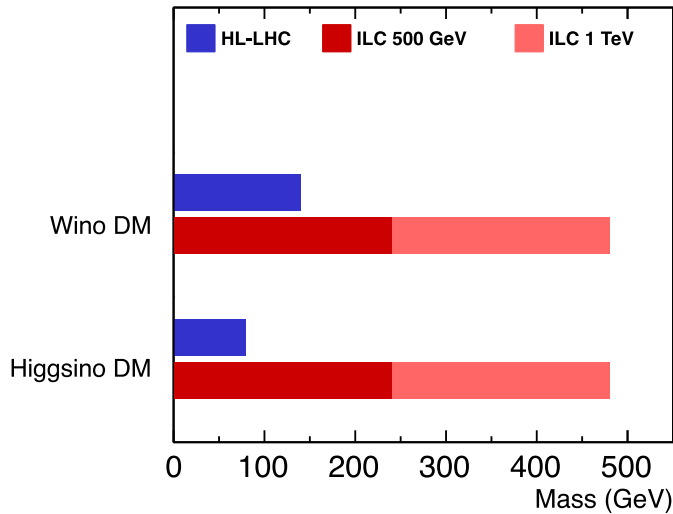


# Various opportunities for direct and indirect New Physics search at the ILC



SUSY GUT

SUSY DM



Taken from the L-T Wang's result at AWLC14

# ILC efforts in Japan

In October 2012, after the discovery of a Higgs –like particle, the Japanese HEP community proposed a phased execution of the ILC hosted in Japan as **a global project**.

## Impacts of this statement

The European Strategy for  
Particle Physics  
Update 2013: May 2013

- e. There is a strong scientific case for an electron-positron collider, complementary to the LHC, that can study the properties of the Higgs boson and other particles with unprecedented precision and whose energy can be upgraded. The Technical Design Report of the International Linear Collider (ILC) has been completed, with large European participation. The initiative from the Japanese particle physics community to host the ILC in Japan is most welcome, and European groups are eager to participate. *Europe looks forward to a proposal from Japan to discuss a possible participation.*

AsiaHEP/ACFA statement on the ILC project: September 2013

AsiaHEP/ACFA welcomes the proposal by the Japanese HEP community for the ILC to be hosted in Japan. AsiaHEP/ACFA looks forward to a proposal from the Japanese Government to initiate the ILC project.

ICFA statement on the progress towards an ILC in Japan: February 2014

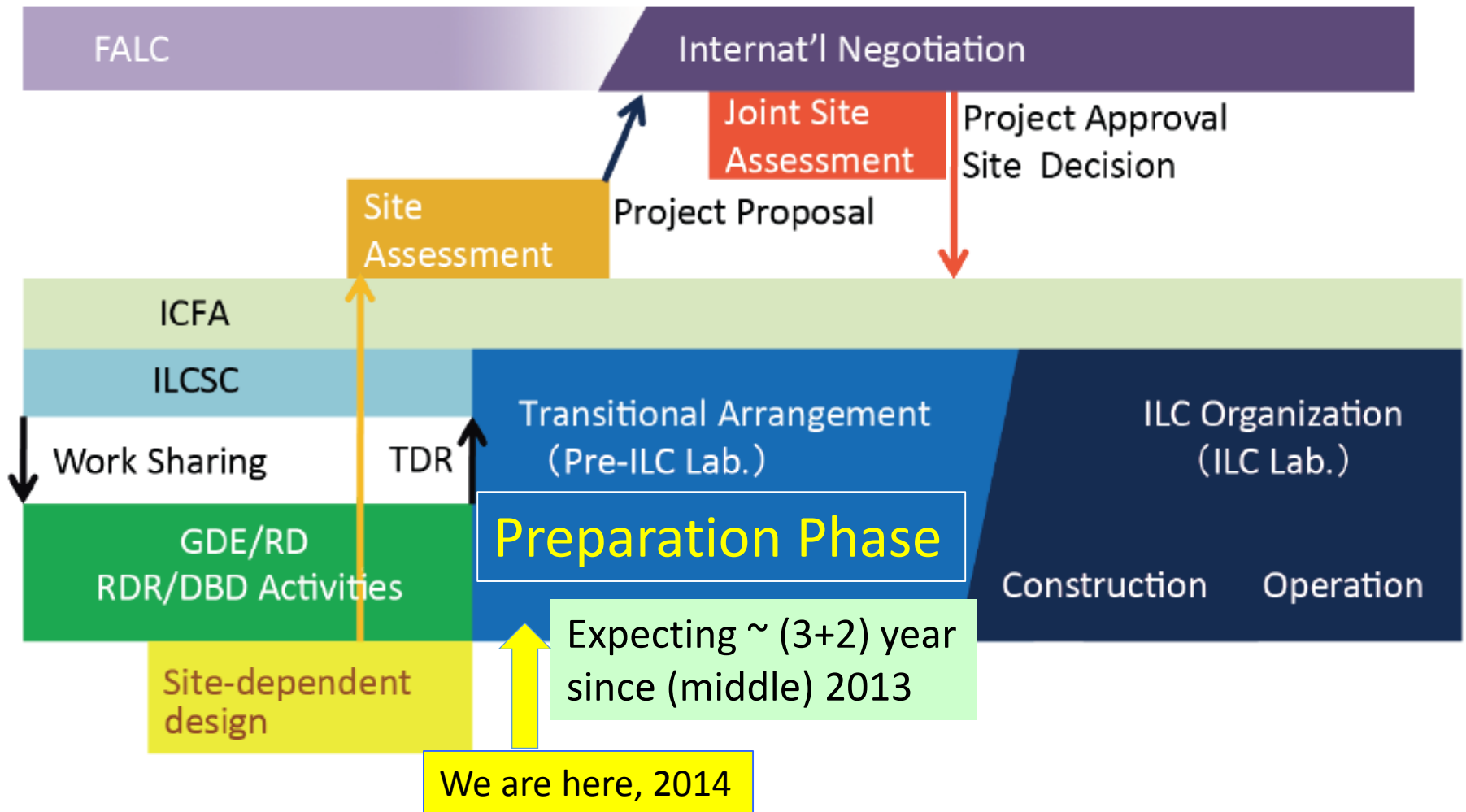
The International Committee for Future Accelerators (ICFA) is pleased to note the great progress of the global community's efforts to realize a linear collider built in Japan. ICFA, which includes the Directors of the world's major accelerator laboratories, will evaluate the technical capabilities worldwide to build the ILC.

US P5 report (draft) :  
May 2014

- The interest expressed in Japan in hosting the International Linear Collider (ILC) is an exciting development. Participation by the U.S. in project construction depends on a number of important factors, some of which are beyond the scope of P5 and some of which depend on budget Scenarios. As the physics case is extremely strong, all Scenarios include ILC support at some level through a decision point within the next 5 years.



# ILC Time Line: Progress and Prospect



# ILC Status

A.Suzuki, May 2014, FNAL

From KEK: KEK sets up Planning Office for the International Linear Collider

## Action Plan in 2012

at European Strategy Meeting  
Dec. 11, 2012

2012 | 2013 | 2014 | 2015~6

Positive Reference  
from New Prime  
Minister

February 6, 2014

August, 2013

Set-up JLCB and JLCC

Establish  
ILC Pre-  
J-Lab.

HEP  
Researchers

Site Decision  
Design ILC Lab.

Formal Message  
on Hosting ILC in Japan

Cite/Host  
Establish

Project Proposal  
to Science Council  
of Japan

Proposal of  
hosting ILC in  
Japan to  
Government

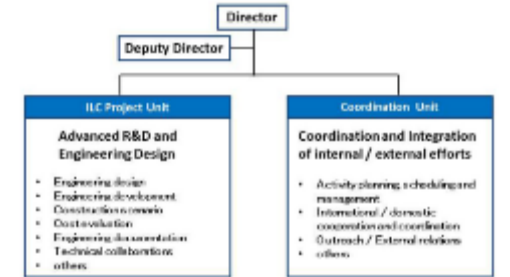
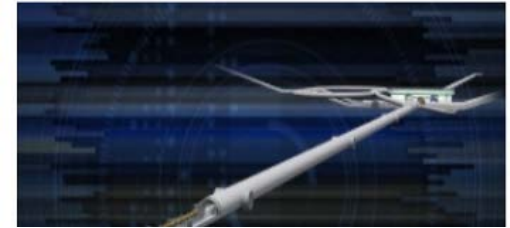
October, 2013

September 26, 2013

Detailed

September 28, 2013

TDR



AROUND THE WORLD

ILC moves forward in Japan

Hiroshi Murawana and Satoko Yamashita | 10 October 2013

On 30 September, the Science Council of Japan (SCJ) submitted the report on the study of the International Linear Collider to the Ministry for Education, Culture, Sports, Science and Technology (MEXT). This was a response to the request by MEXT in May to the council to examine the ILC project including its scientific significance, the project's position in particle physics and in the whole of science, the significance of the project being hosted in Japan and the possible challenges the project will face.

SCJ pointed out obvious issues with international projects, such as cost sharing, its governance model, and availability of leadership and personnel. Therefore,



On 2 October, Minister of MEXT said that the government will create a working group of advisors with specialists from various fields which will review the possible issues on the realization of the ILC in Japan.

In December, 0.5 M\$ requested by MEXT was approved in the fiscal year 2014 budget. Even though the amount is small, it is symbolic that the Japanese government for the first time allocates a "preparatory budget" for the ILC as an official project

## Japan Needs Years to Make Decision on ILC Building: Science Council Panel

Tokyo, Aug. 6 (Jiji Press)--Members of a Science Council of Japan panel agreed in principle Tuesday that Japan should spend several years to examine the significance of leading the proposed international project to construct a next-generation particle accelerator.

After the day's closed-door meeting, University of Tokyo Prof. Yasuhiro Ie, head of the panel reviewing the issue, said that there are uncertain elements to be removed before the panel gives the green light.

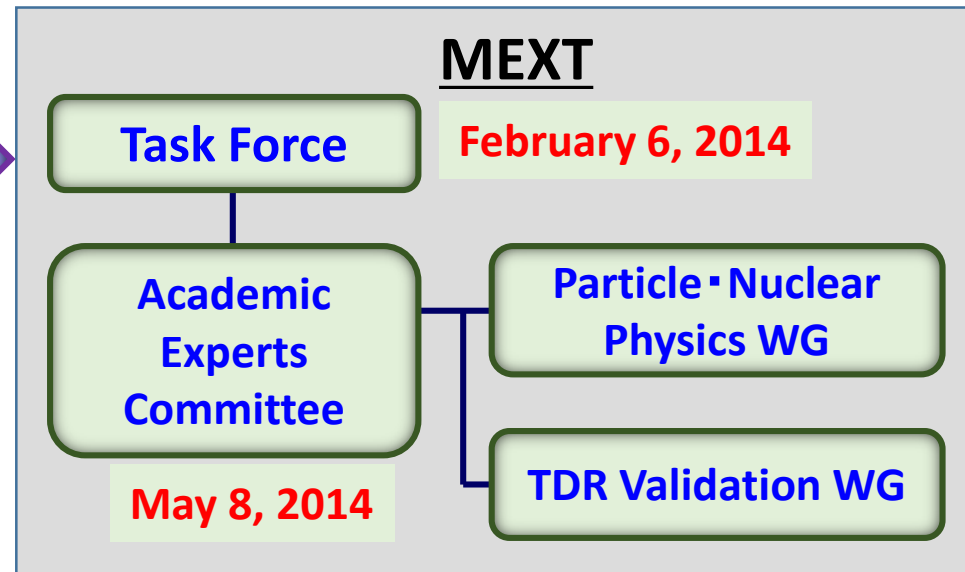
"It is yet to be known if the Japanese public will appreciate huge government spending for such a basic scientific study despite Japan's severe fiscal condition," Ie said. He also expressed concerns about possible cuts in outlays for other research field and difficulty securing more than 1,000 scientists and technicians for the project.

The ILC construction is estimated to cost 630 billion to 830 billion yen, half of which Japan is asked to put up.

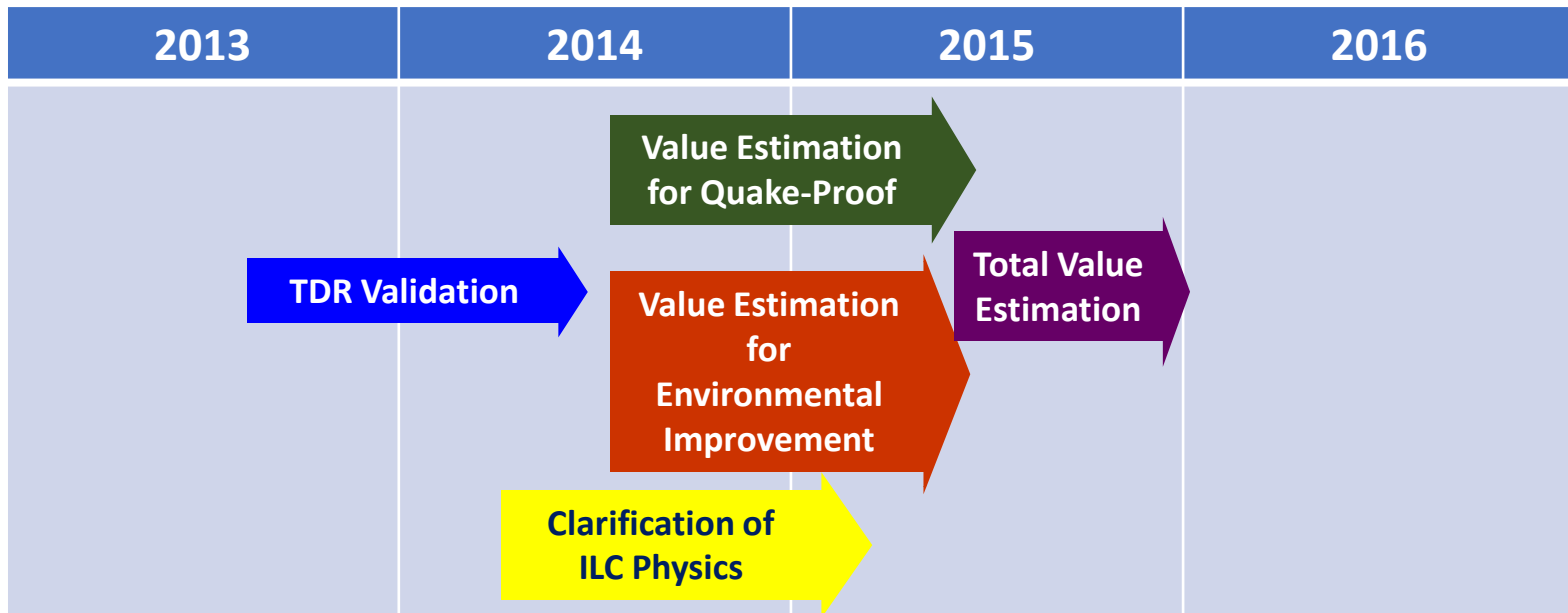
An international group of physicists proposed to build the linear collider in either the Kitakami mountains in northeastern Japan or the Sefuri mountains in southwestern Japan.

(2013/08/06-23:28)

### Review by Science Council of Japan

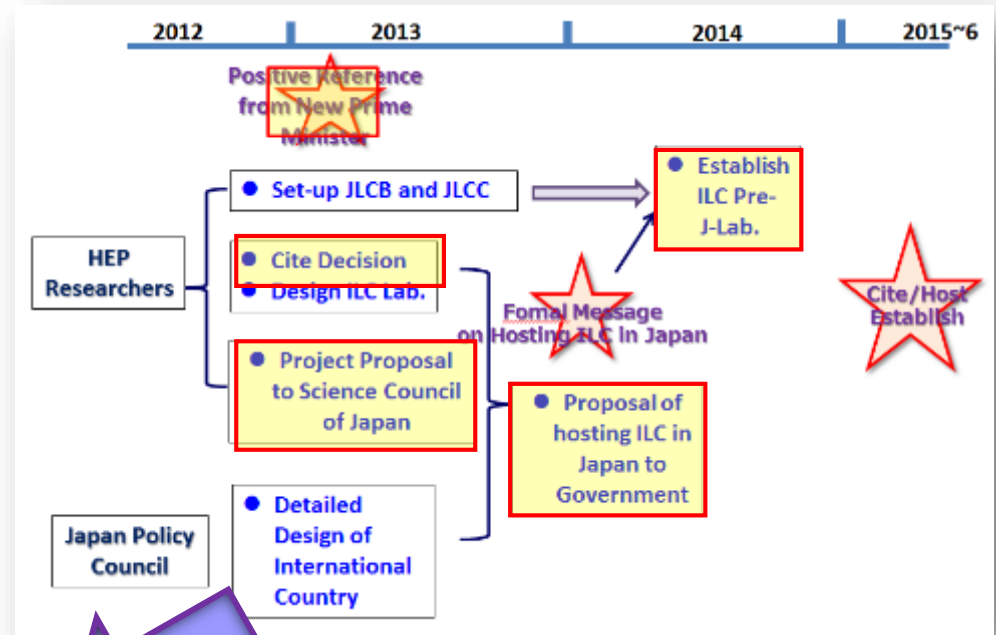


## Review Issues



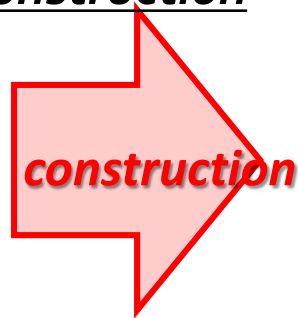
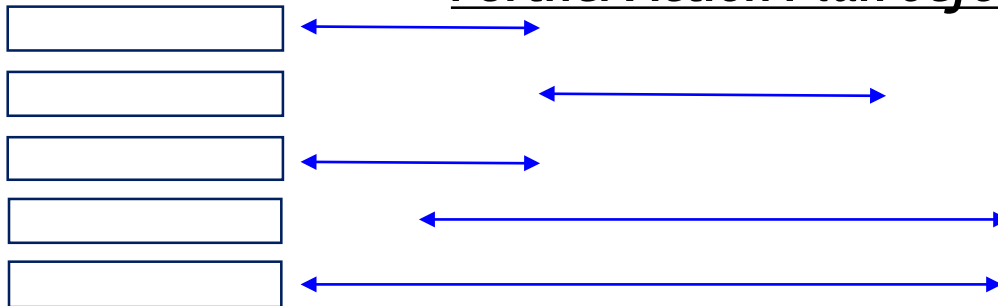
# 2. Action Plan ~~toward~~ before Construction in 2014

2012



2014

## Further Action Plan before Construction



# Further Action Plan before Construction

2014	2015	2016	2017	2018
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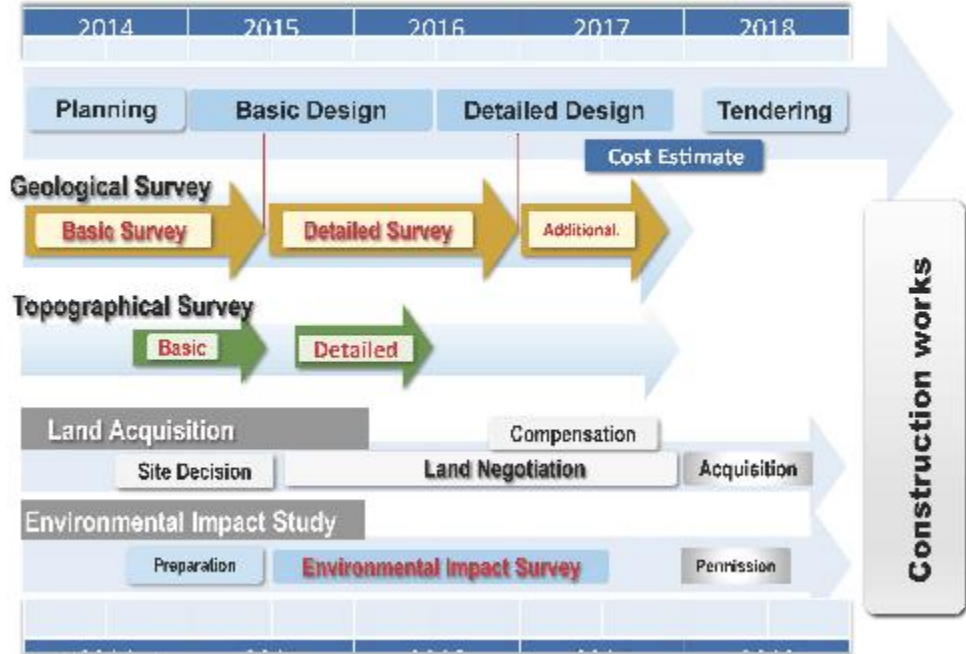
**Engineering R&D  
Schedule  
(LCC-PreLab)**



**Pre-construction  
Schedule  
(LCC-PreLab)**

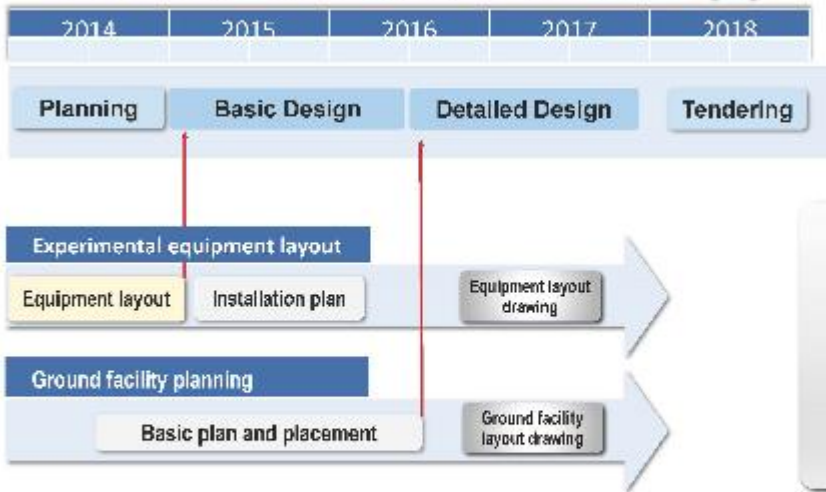


## Pre-Construction Schedule (1)



courtesy Mike Harrison.

## Pre-Construction Schedule (2)



Construction works

progress currently limited by funding

# Further Action Plan before Construction

2014	2015	2016	2017	2018
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Engineering R&D  
Schedule  
(LCC-PreLab)

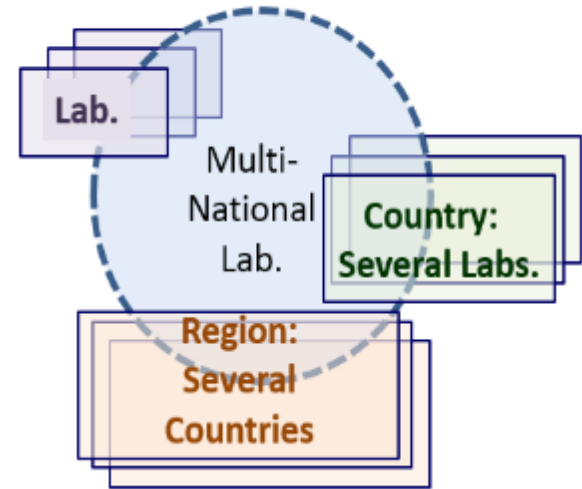
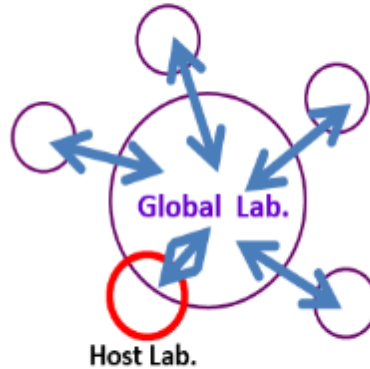
Pre-construction  
Schedule  
(LCC-PreLab)

Staging Scenario  
(LCB, LCC)

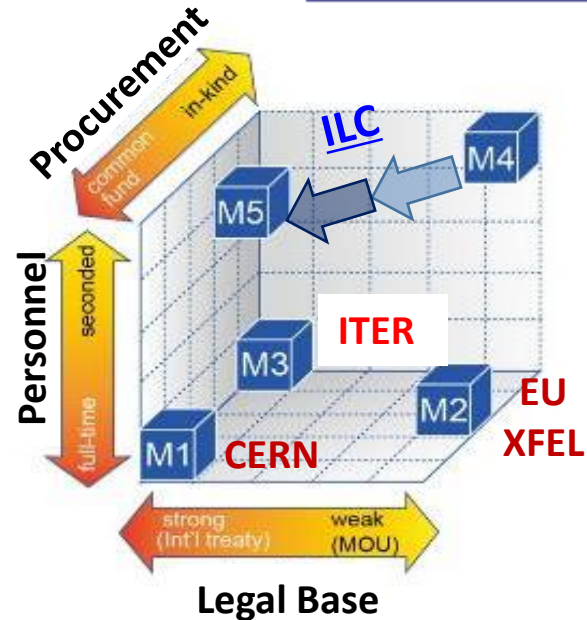
Lab Design: Organization,  
Structure (LCB, LCC)



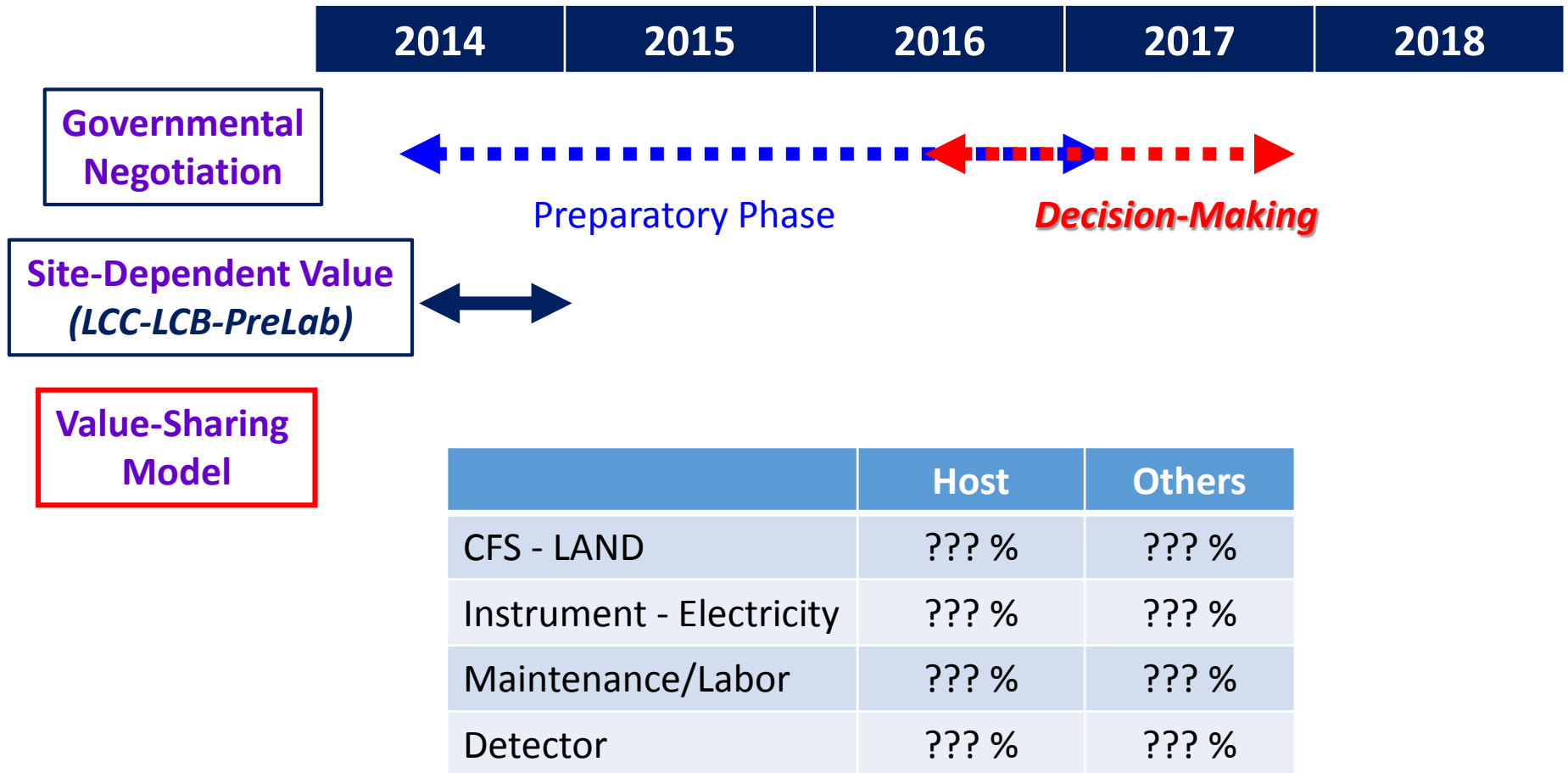
Possibility 2 : Multi-National Lab.



LCB WG (Feb. 2014~)  
PIP & PDG



## Further Action Plan before Construction



# 3. Summary

## Further Action Plan before Construction

