

LCWS12 Machine program & workshop goals

A. Yamamoto, N. Walker, and M. Ross,
ILC-GDE Project Managers
S. Stapnes,
CERN LC Studies Leader

*LCWS12 - Opening Accelerator Plenary ,
12-10-22, 18:00*

- ‘...our field witnessed a deep revolution in the middle of 2012:...’
- (The Physics Case for an $e^+ e^-$ Linear Collider, submitted to European Strategy Preparatory Group Meeting, Krakow, 30.07.2012)

- 1. Deep revolution (‘discontinuity of time’)**
- 2. Japanese evolving interest to host**
 - Preparation of the ‘road map’
- 3. Completion of ILC TDR and CLIC CDR**
- 4. Strategic planning process (semi-decadal)**



Two afternoon plenary sessions on 'Higgs'



1. Tuesday: Higgs Factory Discussion

- at 16:00
- Walker: **Staging in the TDR**
- Gai/Liu: **e+ using 125 GeV drive beam option**
- how to realize a 'light Higgs Factory'
 - (based on ILC technology?)
- The goal of this session is a plan: how to optimize a **staged project**

2. Wednesday: Joint Plenary - Higgs

- Starts at 16:00
- 17:00: Review of Higgs Factory Accelerators
Kaoru Yokoya (KEK)



Tohoku and Kyushu Site Development Consultant reports:

ILC を核とした東北の将来ビジョン策定調査
報告書

Tohoku 'Vision'
July 2012

平成 24 年 7 月

株式会社 野村総合研究所

ILC を核とした東北の将来ビジョン策定検討委員会

サイエンスフロンティア九州構想

—科学の未来に挑戦する国際研究教育特区—

報告書

Kyushu 'Science Frontier'
March 2012

平成 24 年 3 月

福岡県・佐賀県
社団法人九州経済連合会
九州大学・佐賀大学 ILC 推進会議

http://tohoku-ilc.jp/data/report/2012/121002_vision_research_report.pdf

<http://www.pref.saga.lg.jp/web/var/rev0/0107/7246/honpen.pdf>

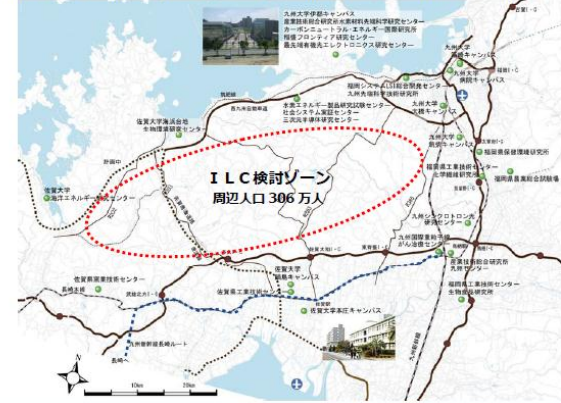
Transportation Infrastructure

図表 「中域交流範囲」の広域交通ネットワーク（動線）の形成イメージ



48

【背振地域周辺の大学・研究機関の集積】 ※国立、公設（財団を含む）の研究機関から一部抜粋
背振地域を取り巻く地域・都市には九州大学、佐賀大学を始めとした研究・教育機関が多数立地している



【期待される効果】

- ◆教育において
 - ・世界で活躍する研究者・技術者・技術経営者などの高度人材の育成
 - ・中等教育においては、体験型・問題解決型学習による次世代の科学・技術を担うリーダー人材の育成
 - ・初等・中等教育における、国際感覚を有する人材の育成、次世代の科学・技術人材の裾野拡大
 - ・子どもから大人まで幅広い層の科学理解の増進
- ◆産業において
 - ・ILC研究所における先端技術開発成果の移転、共同開発型開達の効果的な実施によるILC研究所・企業双方の技術力等の向上
 - ・国際研究機関との取引による中小企業の技術力・信用度の向上、世界への展開
 - ・九州に集積する産業との相乗効果の拡大
- ◆都市形成において
 - ・地域の都市ストック活用による低コストでの整備を実現
 - ・滞在・交流支援のワンストップサービス提供などにより、研究所スタッフ・ユーザー・家族の安全・安心な滞在・居住を実現
 - ・国際研究機関立地による新たな観光資源、観光メニューの開発による交流人口の増大

【経済波及効果】

区分	建設時	運用時	研究所等消費
経費	8,000億円	—	—
内 立地国費負担	4,000億円	—	—
国内経済波及効果	9,300億円	1,800億円	—
内 九州内	(2,300)	(1,100)	—
合計	11,000億円	3,400	—
内 九州内	(3,400)	—	—
区分	建設時	運用時	研究所等消費
経費	250 - 320億円	—	—
内 立地国費負担	140 - 170億円	—	—
国内経済波及効果	330 - 430億円	240億円	—
内 九州内	(10 - 340)	(150)	—
合計	630 - 670億円	—	—
内 九州内	(460 - 400)	—	—

◎算定条件

・GDE ILC Reference Design Report (2007)に基づき、総務省『平成17年(2005年)産業連関表』、経済産業省『平成17年九州地域産業連関表』を用いて算定
・建設期間8年間、建設費(国内調達率50%、立地国費負担率50%)、試験期間電力料金(内100%、67%)、試験運転その他経費(内33%、33%)、研究所消費費を産業連関表に投入して算定
・運用時は、電力料金(国内調達率100%、立地国費負担率67%)、その他経費(内33%、33%)、スタッフ・ユーザー消費額、訪問者・MICEによる消費額を産業連関表に投入して算定
・建設時は10億円の位、運用時は1億円の位を四捨五入して表記
・試算に含まれていない項目：測定器(数百億円を国際分組)、用地費(数十億円)、関連公共事業費(交通基盤・生活基盤は概ね賅っているため)

iii



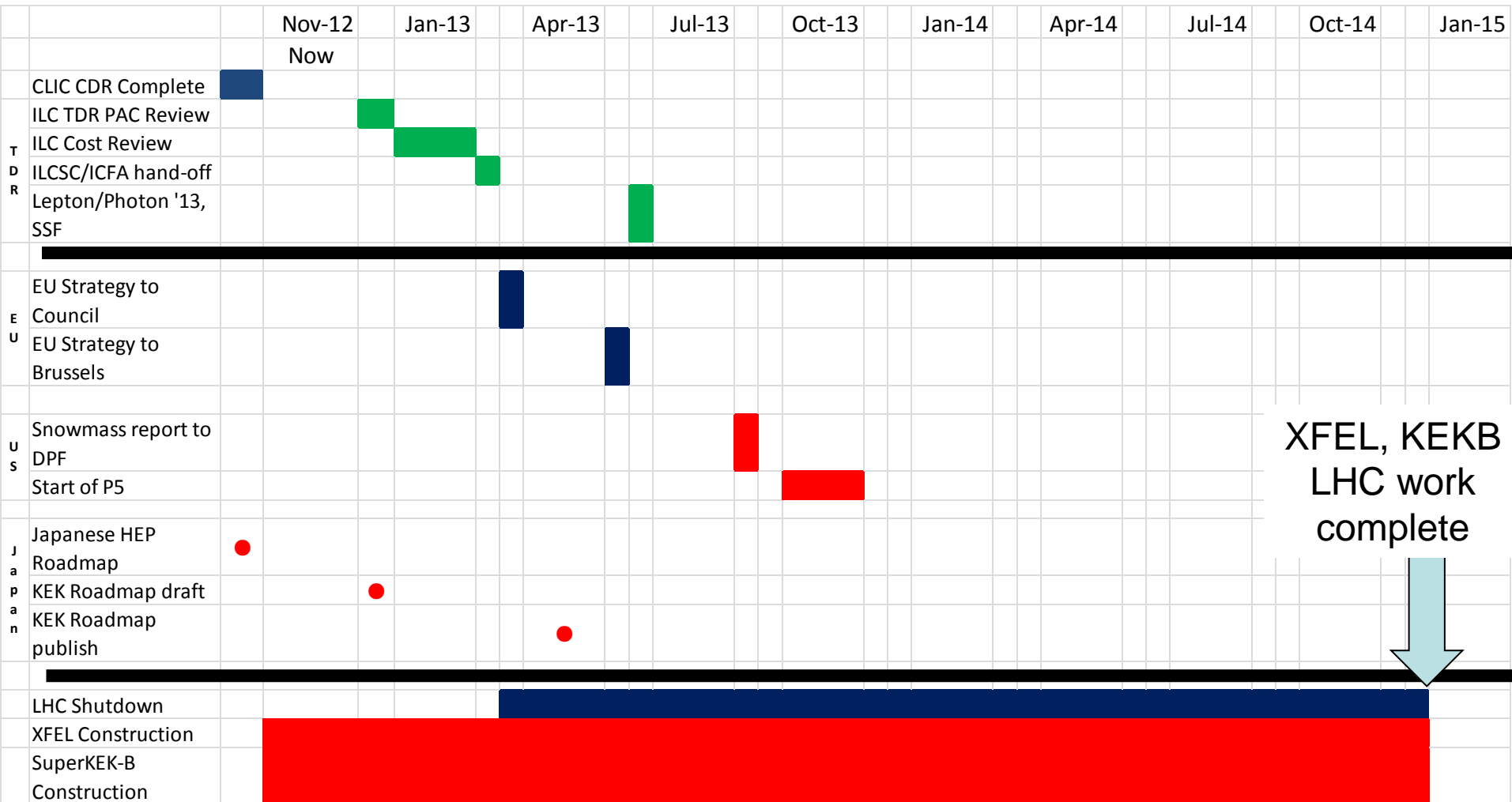
Our Priority:

Produce and Publish a strong machine plan

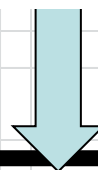
- As strong as possible: we will need it!
- **Technically Reviewed Design Report with**
 - Design description with Cost estimate (Value + ‘US style’)
 - Technical documentation basis (‘EDMS’)
 - Industrial partnerships
 - Project Plan, including in-kind models
 - R & D to be done
- **TDR for ILC; CDR for CLIC (w/different emphasis)**
- **Complementary to development of Physics Case**



Timeline: now to end 2014



XFEL, KEKB
LHC work
complete





Looking back: 2007 ILC TDP Goals

1. An **updated technical description** of the ILC Technical Design in sufficient detail to justify the associated VALUE estimate.
2. Results from **critical R&D** programs and test facilities, which either demonstrate or support the choice of key parameters in the machine design.
3. One or more models for a **Project Implementation Plan**, including scenarios for globally distributed mass-production of high-technology components as “in-kind” contributions.
4. An updated and robust **VALUE estimate and construction schedule** consistent with the scope of the machine and the proposed Project Implementation Plan.



Accelerator Working groups

First Joint Workshop

(Geneva, 10.2010)



The aims of the accelerator working groups were:

to review the status and adequacy of the scientific and technical studies towards the **CLIC conceptual design** and the **ILC technical design** and to identify remaining issues

to review preparation for the development of the **CLIC CD and ILC TD cost estimate**, including component counts and industrialization plans, and make recommendations for further studies

to contribute to a comprehensive discussion of **R&D** status and needs beyond that ongoing for the above design work, including proposals for **future work**

to foster the **ILC-CLIC collaboration** on topics of common interest

The working groups took place on Wednesday and Thursday for the full day. Summaries were presented on Friday morning.



Unusual parallel session arrangement

LCWS: 23 – 25 October, 2012



- **Rather than three solid days of accelerator working group (AWG) meetings, these three days are split between**
 - 1) ad-hoc working groups (Tuesday 23 October),
 - 2) AWG as organized for the two preceding LCWS meetings in Granada and Geneva (Thursday 25 October), and
 - 3) ILC TDR Wrap – up sessions (Wednesday 24 October).
- **While 1) and 2) will be joint meetings of the ILC GDE / CLIC Study group teams**
 - ILC TDR Wrap-up sessions are for ILC-related work and are not considered joint sessions.

LCWS12 Machine Parallel sessions

23 October 2012		24 October 2012			25 October 2012	
		Separate ILC and CLIC sessions				
	Accelerator Plenary Common Topics	ILC TDR Wrap-up		CLIC Project Meeting	Accelerator Working Groups	
AM1	Emittance Preservation <i>Daniel Schulte (CERN)</i> <i>Kaoru Yokoya (KEK)</i>	AM1	TDR Status John Carwardine	AM1 and AM2	CLIC Project Meeting, Steinar Stapnes	
AM2	Power Consumption <i>Philippe LeBrun (CERN)</i> <i>Chris Adolphsen (SLAC)</i>	AM2	TDR Wrap-up meetings SCRF, CFS, AS, Cost		AM1 and AM2	AWG Parallel sessions see conveners
LUNCH						
PM1	Project and Cost Schedule Basis <i>Gerry Dugan (Cornell)</i> <i>Philippe LeBrun (CERN)</i>	PM1	TDR Wrap-up meetings SCRF, CFS, AS, Cost		PM1 and PM2	AWG Parallel sessions see conveners
	System Tests <i>Roberto Corsini (CERN)</i> <i>Hitoshi Hayano (KEK)</i>					
PM2	Machine-side plenary 'Higgs Factory Discussion'	PM2	Joint Plenary 'Higgs'			



Ad-hoc Working Groups (Tuesday)



- topics of **common concern** between the ILC and CLIC design teams.
 - a) Emittance preservation, AM1
 - b) Power consumption, AM2
 - c) System tests, and PM1
 - d) Cost and schedule. PM1
- **The ad-hoc working group conveners are listed on indico**
- **to make a presentation you are urged to contact them.**



7 Joint CLIC/ILC Accelerator Working Groups (Thursday)



1. Sources

- (Wei Gai, Steffen Doebert),

2. Damping Rings

- (David Rubin, Yannis Papaphilippou),

3. Beam Dynamics

- (Andrea Latina, Nikolay Solyak, Kaoru Yokoya),

4. Beam Delivery and MDI

- (Rogelio Tomas, Jie Gao, Thomas Markiewicz),

5. CFS

- (Victor Kuchler, John Osborne, Atsushi Enomoto),

6. Technical Systems

- (Thibaut LeFevre, Marc Ross, Shinichiro Michizono, Andrea Jeremie)

7. RF

Structure/Technologies

- (Hitoshi Hayano, Chris Nantista, Akira Yamamoto, Walter Wuensch).



GDE Accelerator Working Group Goal:

LCWS12:

- The TDR text includes lists of **future work** for technical and cost-reduction objectives.
 - review these lists and discuss status and plans.
- The AWG parallel sessions should include discussions on extending **collaboration** between CLIC study and ILC.
- **To be reported in closing Accelerator Plenary**



Summaries: Friday, 26 October



- final day machine plenary
- 15 minute summaries from each of the 4 common topic 'ad-hoc working group' sessions
- 1-slide 5 minute presentation from AWG's

09:00 - 10:35

Accelerator Plenary

Convener: Prof. Brian Foster (University of Oxford)

Location: Rosebud Theater

09:00 **Power Consumption Report 15'**

09:15 **Emittance Preservation Report 15'**

09:30 **Project and Cost Schedule Basis Report 15'**

09:45 **System Test Report 15'**

10:00 **Joint CLIC/ILC Working Group - RF Structure/Technologies Report 5'**

10:05 **Joint CLIC/ILC Working Group - CFS Report 5'**

10:10 **Joint CLIC/ILC Working Group - Beam Delivery and MDI Report 5'**

10:15 **Joint CLIC/ILC Working Group - Beam Dynamics Report 5'**

10:20 **Joint CLIC/ILC Working Group - Damping Rings Report 5'**

10:25 **Joint CLIC/ILC Working Group - Sources - Report 5'**

10:30 **Joint CLIC/ILC Working Group - Instrumentation and Technical Systems Report 5'**

10:30 - 11:00

Break (Rosebud Foyer)



TDR Wrap-up sessions, LCWS 12

24.10, Wednesday

- **ILC-only parallel sessions: no joint CLIC work**
- **3 sessions - Morning 1 and 2 (AM 1 and 2), Afternoon 1 (PM 1)**
 - AM 1: TDR Summary by John Carwardine – ILC GDE Plenary
 - AM 2 and PM 1: Parallel sessions →
 - (PM 2: Higgs machine joint plenary)
- **Four ‘wrap-up session’ groups**
 - SCRF, CFS, AS, Cost
 - Four rooms have been reserved



TDR Wrap-up sessions

- **Authors, Contributors, Editors, EC assignees and PM meet to discuss remaining issues.**
 - (e.g. Elsen SCRF, Burrows CFS, Phinney AS)
 - content, figures, bibliography, consistency, completeness, supplemental documentation and design documents for EDMS.
- **Also begin preparation for upcoming 3 GDE reviews**
 - (November 2012, December 2012 and January 2013)
 - define review-preparation homework at the Wrap – up sessions.



CLIC goals for LCWS2012



CDR now **completed** so focus is now on next stage (2012-16) towards a project development plan (see [timeline on next slide](#)):

- Rebaselining of machine parameters. With the CDR work, and LHC results, there is better basis for defining the stages of machine and optimise each stage (for the CDR the parameters were optimised for 3 TeV)
- Technical development programme across the collaboration. Around 35 work-packages are defined and in various ways agreed with the collaborating institute, follow up of these are needed and will be a focus
- Define common technology development projects with other potential users of NC X-band technology
- Review existing and consider future systems tests for a CLIC machine implementation
- Work, together with ILC colleagues to increase and join work in all areas possible

This work will not be completed during this week but will be prepared for and followed up in the CLIC workshop end January at CERN: <https://indico.cern.ch/conferenceDisplay.py?confId=204269>

CLIC project time-line

2012-16 Development Phase

Develop a Project Plan for a staged implementation in agreement with LHC findings; further technical developments with industry, performance studies for accelerator parts and systems, as well as for detectors.



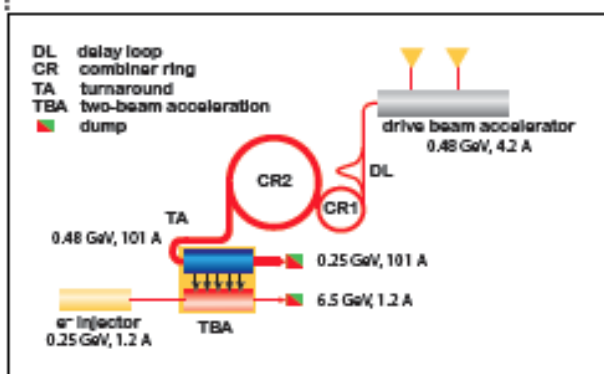
2016-17 Decisions

On the basis of LHC data and Project Plans (for CLIC and other potential projects), take decisions about next project(s) at the Energy Frontier.

2017-22 Preparation Phase

Finalise implementation parameters, Drive Beam Facility and other system verifications, site authorisation and preparation for industrial procurement.

Prepare detailed Technical Proposals for the detector-systems.



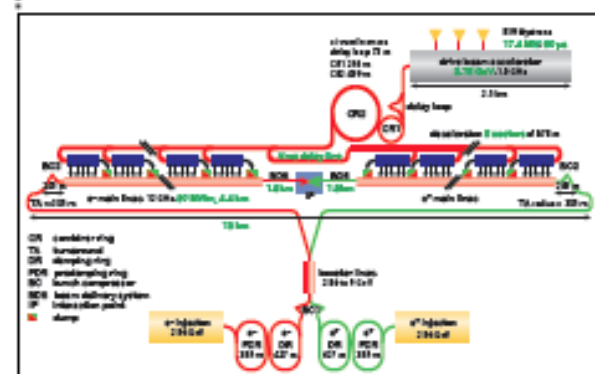
2022-23 Construction Start

Ready for full construction and main tunnel excavation.

2023-2030 Construction Phase

Stage 1 construction of a 500 GeV CLIC, in parallel with detector construction.

Preparation for implementation of further stages.



2030 Commissioning

From 2030, becoming ready for data-taking as the LHC programme reaches completion.

- Fermilab (10.2007), Sendai (03.2008), ... Granada (10.2011), Daegu (04.2012), Arlington (10.2012).
- Joint ILC / CLIC: Geneva (10.2010), Granada(10.2011), Arlington (10.2012)

