



# Introduction and aim of meeting

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ILD meeting, Cambridge 2008.9.11





# GDE Timeline

- TDP I : 2010
  - Technical risk reduction
  - Cost risk reduction
  - Global design
  
- TDP II : 2012
  - RD unit test
  - Complete necessary technical designs (exceptions)
  - Project plan by consensus
  
- Detailed engineering will follow before construction



# Minimum Machine

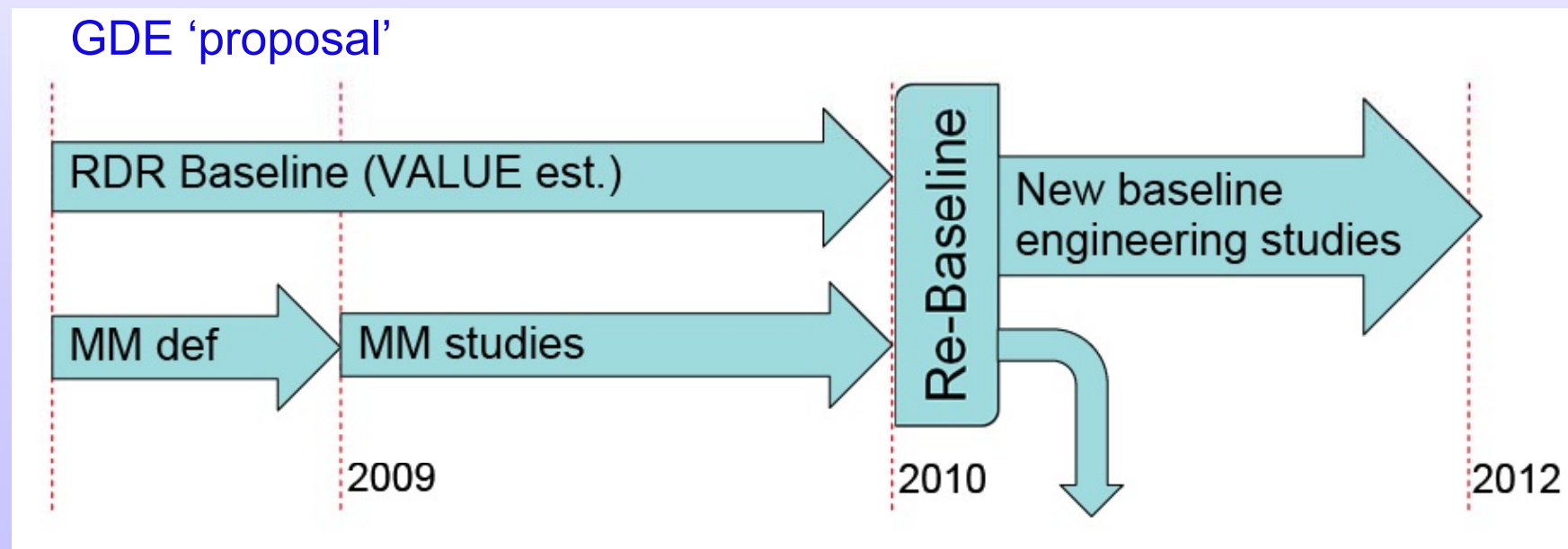


- ◆ No change in luminosity&energy (phase 1)

- ◆ Possible savings:

Single tunnel, shallow site, smaller DR,

500 GeV machine only, Low-P params...





# Detector Timeline



- Detector Design Phase I : 2010
  - Focus on critical R&Ds
  - LOI validation by IDAG
  - Update physics performance
  - MDI
  
- Detector Design Phase II : 2012
  - React to LHC results
  - Confirm physics performance
  - Complete necessary R&Ds
  - Complete technical designs
  - Cost (reliable)



# LOI validation



- Submission deadline
  - March 31, 2009
- Validation
  - NOT a down-selection to two detectors
- LOI group members
  - Signing LOI do not indicate a formal commitment to the detector concept
- Time scale of validation
  - Not well-defined yet. ~ 1/2 year?



## LOI Guideline (October 3, 2007)



(rearranged)

With the LOI, a group **expresses its interest to develop a design for a detector at the ILC.**

Enable the reader to judge the **potential of the detector concept, the capacity and the seriousness of the groups** to carryout the work.

The group submitting the LOI should **define its position and role in the ongoing international research and development for a detector at the ILC.**

The overall length of the LOI **should not exceed 100 pages.**



## LOI Guideline cont'd



### CONTENTS:

- ◆ Its overall **philosophy**, its **sub-detectors** and **alternatives**, and **how these will work in concert to address the ILC physics questions**.
- ◆ State of technological developments for the different components. **Alternative technological options** should be elaborated. **Missing R&Ds, timelines and milestones**.
- ◆ **Structure of the group, resource needs and their evolution in time**.
- ◆ Preliminary **cost estimate** for the detector.



# IDAG additional questions

(preliminary - given to LOI reps by RD)

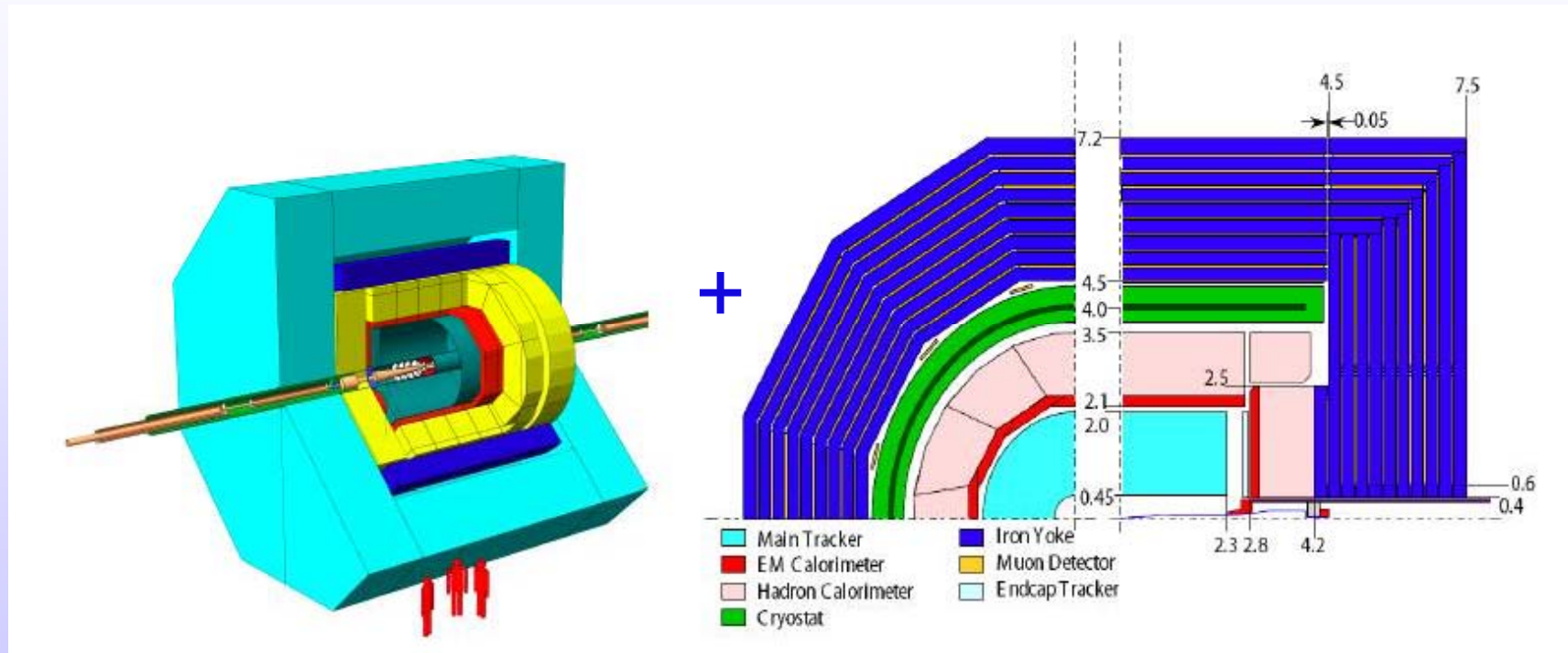


- Sensitivity of different detector components to **machine backgrounds** as characterized in the MDI panel
- **Calibration and alignment** schemes
- Status of an **engineering model** describing the support structures and the dead zones in the detector simulation
- Plans for getting the **necessary R&D results** to transform the design concept into a well-defined detector proposal
- **Push-pull** ability with respect to technical aspects (assembly areas needed, detector transport and connections) and maintaining the detector performance for **a stable and time-efficient operation**
- A short statement about the energy coverage, identifying the deterioration of the performances when going to **energies higher than 500 GeV** and the considered possible detector upgrade
- **How was the detector optimized**: for example the identification of the major parameters which drive the total detector cost and its sensitivity to variations of these parameters





# LDC/GLD → ILD



= ? (ILD)



# LDC/GLD → ILD

(From a talk at ALC PG07)



## ■ Pros

- More manpower, more funds
- Political critical mass
- Revitalization of studies

Physics and detector optimization

Focused studies in the 'horizontal collaborations'

## ■ Cons

- Need to unify the detector design
- Can we work together?

Prides, regional priorities, political power share

## ■ We have decided that pros outweigh cons

- So we hope!

Now is the time of judgment!



## LDC/GLD → ILD



### ■ History:

- After Beijing ACFA, Feb 07
  - Some talks of close collaboration between LDC/GLD
- Before DESY LCWS : (~May 07)
  - Joint contact persons' meetings
  - Agreed to move toward a single joint LOI
  - GLD EB approved 'single joint LOI'.
- DESY LCWS07
  - First joint concept study meeting
  - LDC meeting approved 'single joint LOI'
- 'ILD' named, JSB established to manage LOI efforts (Sep, 07)
- First ILD mini-workshop (ALCPG07, Oct. 07)
- First dedicated ILD workshop (Zeuthen Jan, 08)



# Unifying LDC and GLD



- Minimum parameters to define at this meeting:
  - ECAL ID
  - B field
  - + more if possible
- Criteria
  - Scientific data that all can agree upon
    - Covered in the optimization sessions
    - Single particle performances
    - Physics performances
  - Cost - talk by Henri
    - Very rough estimate
    - Not an exact parametric optimization
  - ... and some political issues



## Toward a single LOI



- LOI needs more to be defined/unified
  - TPC ID
  - TPC Z
  - ECAL, HCAL thicknesses
  - MDI design
  - .....
- Some options can be left open
  - ECAL Si and Scint.
  - Vertexing technology
  - ...
- Create mechanism to define further details at this meeting



# ILD LOI outline

(from slides shown at Zeuthen: slightly edited)



## ■ Chapters (preliminary suggestion)

### ● Overview - ~10 pages

Overall philosophy and a brief description of ILD

### ● Performance optimization - ~25 pages

Simulation studies on single particle performances and the agreed-upon bench mark modes and extended modes if any.

Assessments of impacts on detector design

### ● Subdetectors - ~40 pages

Requirements, technology choice and options

State of R&Ds, missing R&Ds, time lines, calibration and alignment schemes, basic engineering issues



# ILD LOI outline

(from slides shown at Zeuthen)



- Detector Integration - ~10 pages  
civil engineering issues  
Detector solenoid, Structures, push-pull, etc.
- DAQ and computing - ~5 pages
- Cost and resource needs - ~5 pages
- Group structure - ~3 pages

**This is just a very rough example.**

In general, subdetectors sections will have to be more focused than DODs.



## Unifying softwares



- Avoid redundant use of resources (CPU, people)
  - Reconstruction software developments
  - Database generations (e.g. backgrounds)...
- Some large collaborations have had independent analysis groups
  - Scientific check - maybe we cannot afford it.
- Goal :
  - A unified system jointly managed by 'GLD side' and 'LDC side' (hopefully no more 'sides' in near future)  
Creation of a software management under the software WG leaders?
- Discussion at the end of this meeting





# ILD executive board

- management -



- Joint Steering Board
  - Ties Behnke, Dean Karlen, Yasuhiro Sugimoto, Henri Videau, Graham Wilson, Hitoshi Yamamoto
- Optimization
  - Yosuke Takubo, Mark Thomson
- MDI
  - Karsten Buesser, Toshiaki Tauchi
- Cost
  - Henri Videau, Akihiro Maki
- Technical coordinators
  - Mark Jore, Claus Sinram, Hiroshi Yamaoka
- Software
  - Frank Gaede, Akiya Miyamoto



# ILD executive board

## - Subdetector contacts -

- VTX:
  - Yasuhiro Sugimoto, Mark Winter
- SiTRK
  - Aurore Savoy-Navarro, Hwanbae Park
- TPC
  - Keisuke Fujii, Ron Settles
- ECAL
  - Jean-Claude Brient, Kiyotomo Kawagoe
- HCAL
  - Felix Sefkow, Imad Laktineh
- FCAL
  - Wolfgang Lohmann
- DAQ
  - Gunter Eckerlin, Mathew Wing (?)





PAC

ILCSC



IDAG

Executive Board

RD  
Regional Contacts

GDE

WWS organizers

Phys.&Exp.Board

Lol-representative

Common task representative

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MDI-D  
Engineering Tools

IR Integration

R&D panel

R&D Collab.

Software panel

Physics Panel

Outreach Panel

Th's



# ILD executive board

- RD reps -



- LOI representatives
  - Ties Behnke, Yasuhiro Sugimoto
- MDI
  - Karsten Buesser, Toshiaki Tauchi
- Engineering tools
  - Catherine LeClec
- R&D
  - Dhiman Chakraborty, Tohru Takeshita , Jan Timmerman
- Physics
  - Klaus Desch, Keisuke Fujii
- Software
  - Frank Gaede, Akiya Miyamoto



## Goals of workshop



In order to complete LOI in time,

- Define ECAL ID and B + more if possible
  - Establish roadmap of defining other params
  - Work out the status/plan of subdetector R&Ds
  - Start forming LOI outline and editing framework
- and
- Move toward unified software system/management
  - ... more