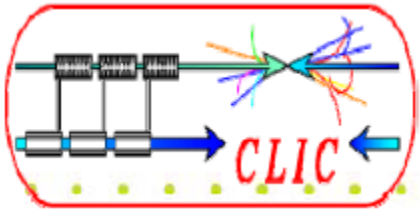



# CLIC-ILC Cooperation

## ILC "PAC Review" – Vancouver

## May 9, 2009

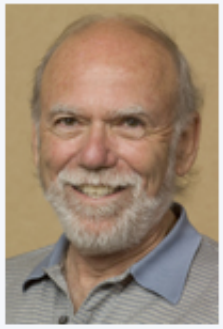
## Conventional Facilities
## Cost & Schedule
## Working Groups

reported by Peter H. Garbincius

CLIC-ILC_phg_9may09.ppt

## Director's Corner

**13 December 2007**



Barry Barish

### A more integrated approach toward an energy frontier lepton collider . . . . .

Although the work to develop the ILC design and the R&D to demonstrate CLIC feasibility has little in common technically, there are close relations between the two groups. This is especially the case because Jean-Pierre Delahaye, the CLIC Study Group Leader, is an active and important member of the ILC Global Design Effort.

Jean-Pierre Delahaye, CERN CLIC Study Group Leader

For some time now, I have been coming to view that the ILC and CLIC efforts should be more closely integrated. Beyond the feasibility tests for CLIC, their emerging work will involve physics studies, detector concepts and a first-order design of the rest of the accelerator complex. For this work, CLIC faces many of the same issues we are dealing with for the ILC, with some significant differences due to the different technology and energy. Nevertheless, to best accomplish the work for both projects and to be best able to evaluate alternative approaches to the lepton collider, like a warm machine or CLIC, we should do all we can to integrate these R&D and design efforts.

When I visited CERN last month, I had the opportunity to have a meeting with the CLIC Extended Steering Committee, including CERN Global Design Effort members. I suggested that joint work between the ILC and CLIC could have benefits for both efforts. They responded positively, and a number of specific areas have been identified where both groups could benefit. It is clear that the timescale for a machine like CLIC, even if feasible, is much later than the ILC. So the reason to consider CLIC is for energy reach, if required.

Following my visit to CERN, I discussed these joint efforts with the GDE Executive Committee, and we agreed to the general idea. As a result, the GDE Project Managers will explore specific areas of collaboration with CLIC. An exchange of ideas has begun by email, and a meeting is now planned at CERN for February 2008 to explore specific areas of cooperation.

I am hopeful that closer relations will be forged between the two groups. Our ultimate goal is to develop a lepton collider that will complement LHC physics, and I believe closer integration with CLIC will further our goal of realising a linear collider -- whatever LHC physics tell us.

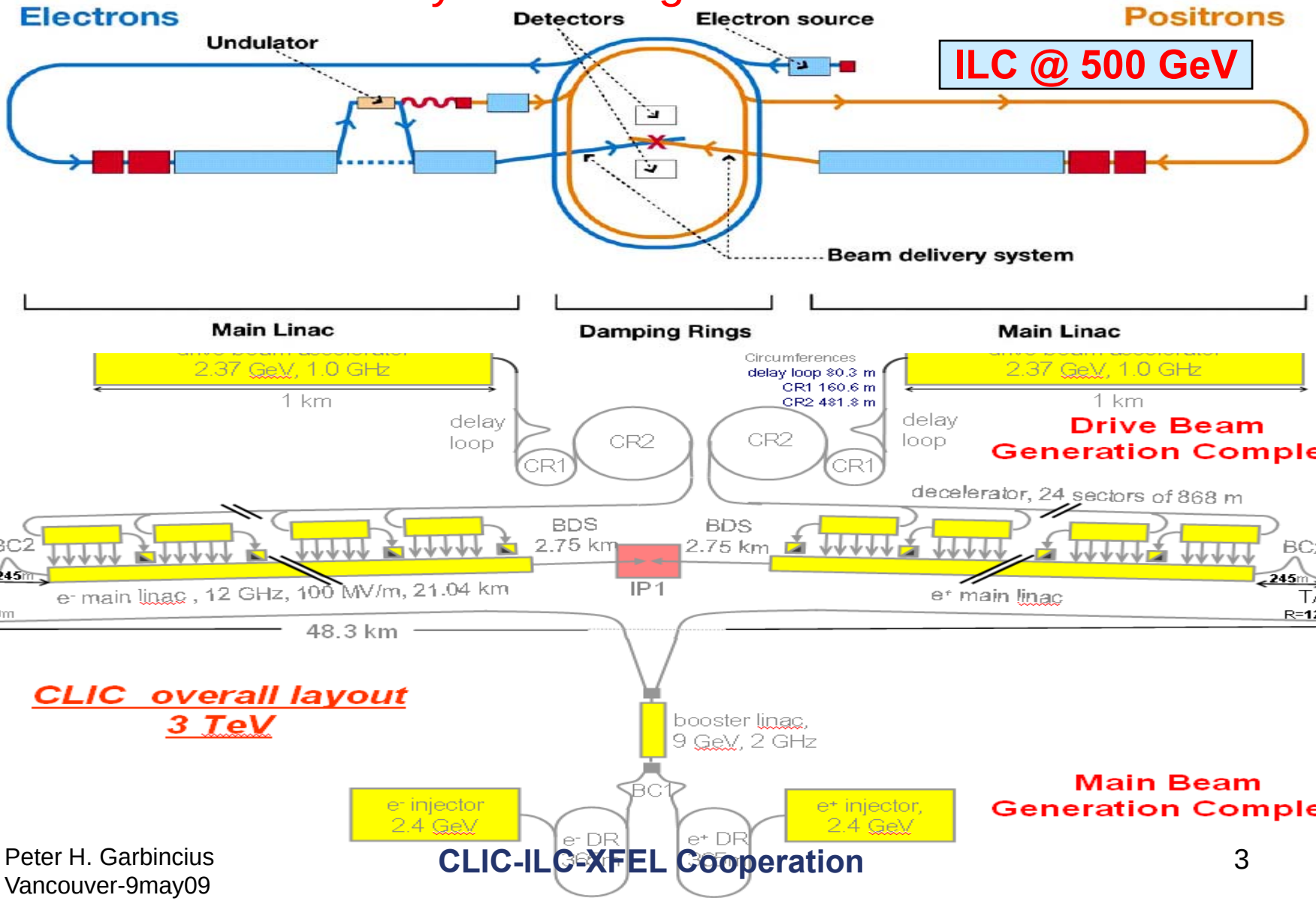
*-- Barry Barish*

Kick-off the CLIC-ILC Collaboration

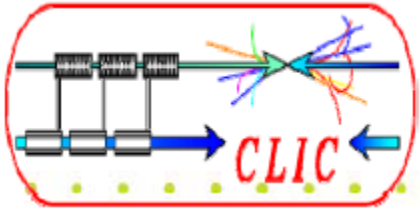
same physics – just different technologies

# CLIC and ILC layouts

Jean-Pierre Delahaye – Chicago – Nov08



# *paraphrasing* Jean-Pierre Delahaye @ LCWS08 – Chicago – Nov08

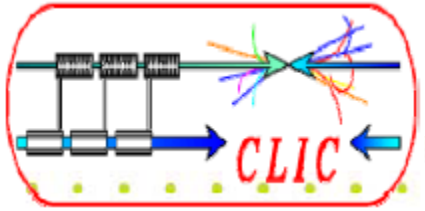



- CLIC/ILC collaboration on subjects with strong synergy
- Ambitious but realistic and practical approach
  - starting on limited number of subjects
  - mandates and plan of actions developed by conveners
  - adopt systems, tools, cost bases as similar as possible
- Most efficient use of limited resources
- Provide ***credibility*** to Linear Collider Community by:
  - mutual understanding of status, advantages, issues of both tech.
  - responsible preparation of the future comparison of the possible options for HEP with agreed pro & cons and well defined criteria

Win –Win for both CLIC & ILC studies and for HEP

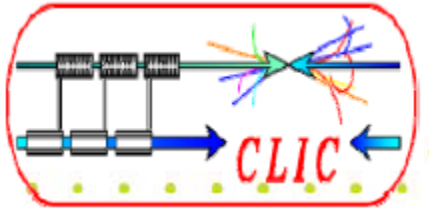
Collaborative Competition and/or Competitive Collaboration

# Subjects with strong synergy
# Working Groups & Conveners




| J-P Delahaye – LCWS08 - Nov08 CLIC | ILC |
|---|---|
| **Physics & Detectors** | L.Linssen, D.Schlatter | F.Richard, S.Yamada |
| **Beam Delivery System (BDS) & Machine Detector Interface (MDI)** | D.Schulte,<br>R.Tomas Garcia<br>E.Tsesmelis | B.Parker, A.Seriy |
| **Civil Engineering & Conventional Facilities** | C.Hauviller,<br>J.Osborne. | J.Osborne,<br>V.Kuchler |
| **Positron Generation (new)** | L.Rinolfi | J.Clarke |
| **Damping Rings (new)** | Y.Papaphilipou | M.Palmer |
| **Beam Dynamics** | D.Schulte | A.Latina, K.Kubo, N.Walker |
| **Cost & Schedule** | H.Braun, K.Foraz,<br>G. Riddone, P. Lebrun | J.Carwardine, P.Garbincius, T.Shidara |

# Outline of CLIC-ILC Activities




**I'll concentrate on two most active WGs**

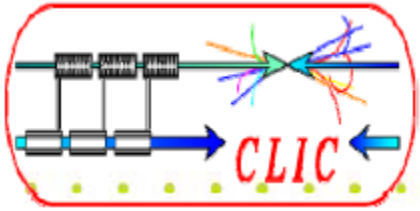
## Conventional Facilities: ILC-CFS & CLIC-CES

- ***also cooperative activities with XFEL and Project X***
- 3 D Modeling for Civil Engineering & Installation
- Transportation & Installation of Equipment
- Cooling and Ventilation
- Interaction Region Design
- Joint Safety Document
- Cost Estimating methodolgy

## Cost & Schedule WG:

- Goal: compare cost estimates by the end of ***2010*** using similar methods and metrics
- Gave ILC RDR cost estimate & backup info for BDS to CLIC
- Cost Templates & Tools - similarities & differences
- Common Risk Document
- Common Scheduling Methods
- Common Conventional Magnet Estimating Methods

# CLIC / ILC Mandate for CFS Works – Sept 08




- **The following working groups already exist :**
  **'Civil Engineering and Services' (CES) for CLIC, based at CERN**
  **The 'Conventional Facilities & Siting Team' (CFS) for ILC**

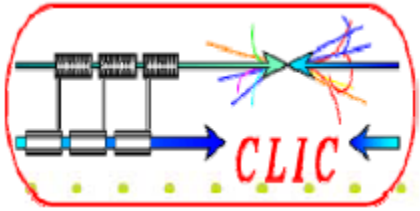
  **These groups work independently on the civil engineering and services side of both projects. However, it has been agreed that resources permitting, both groups will work together on areas of mutual interest for both projects, including :**

- **Civil Engineering Studies**
  - **Optimization of Tunnel & Shaft diameters, distance between shafts (linked to safety)**
  - **Overall layout of the machine and interaction region infrastructure**
  - **Shallow Site vs. Deep Tunnel Option**
  - **Single Tunnel vs. Double Tunnel**
  - **Safety issues such as emergency egress**
  - **Environmental issues etc.**

- **Other Infrastructure**
  - **Cooling Water**
  - **Power Distribution**
  - **Air Handling**
  - **Transport Issues**
  - **Radiation simulations / shielding etc.**

- **The progress of these working groups on areas of mutual interest will be reported at the ILC-GDE & CLIC Collaboration Meetings working towards CLIC CDR and ILC TDP Phase I in 2010.**

# CAD Software *Mix!* => ILC




Civil Eng: CERN - Catia

IP

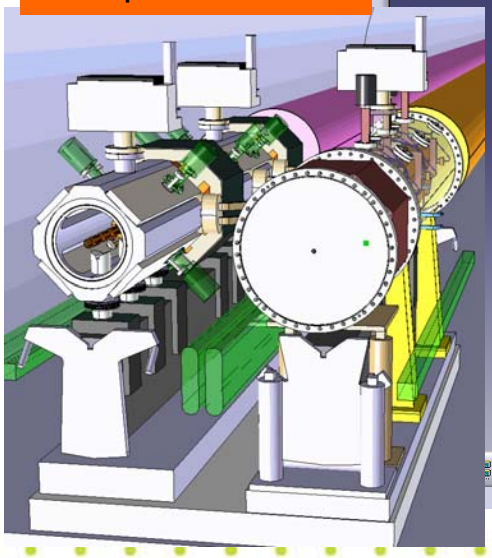
BDS: SLAC - Solid Edge

Bulk Component Footprints

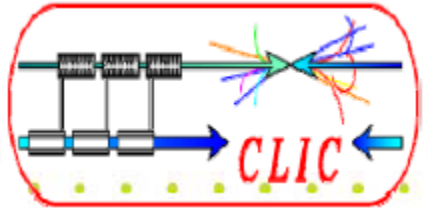
Main Linac: FNAL – I-DEAS

Translated by SKIP into I-DEAS & stored in ILC EDMS by DESY

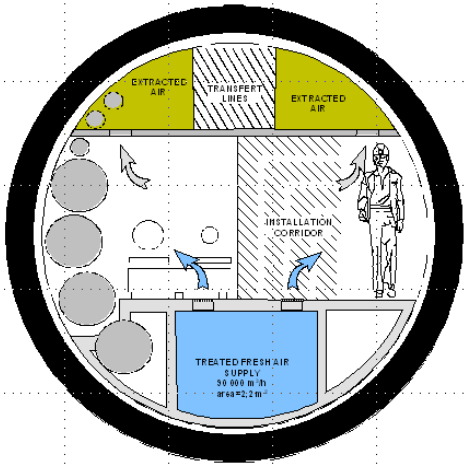
Can add details e.g. Catia – CLIC components later

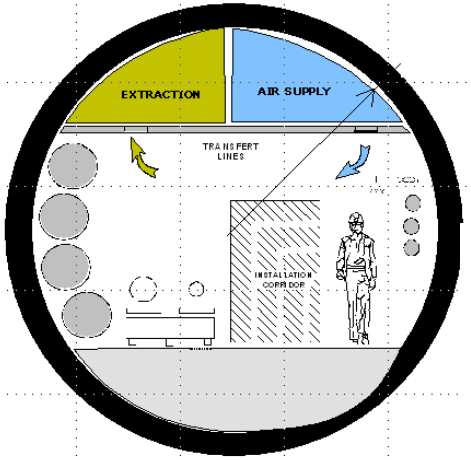


# CFS: Tunnel Configuration
# Cooling, Ventilation, Installation

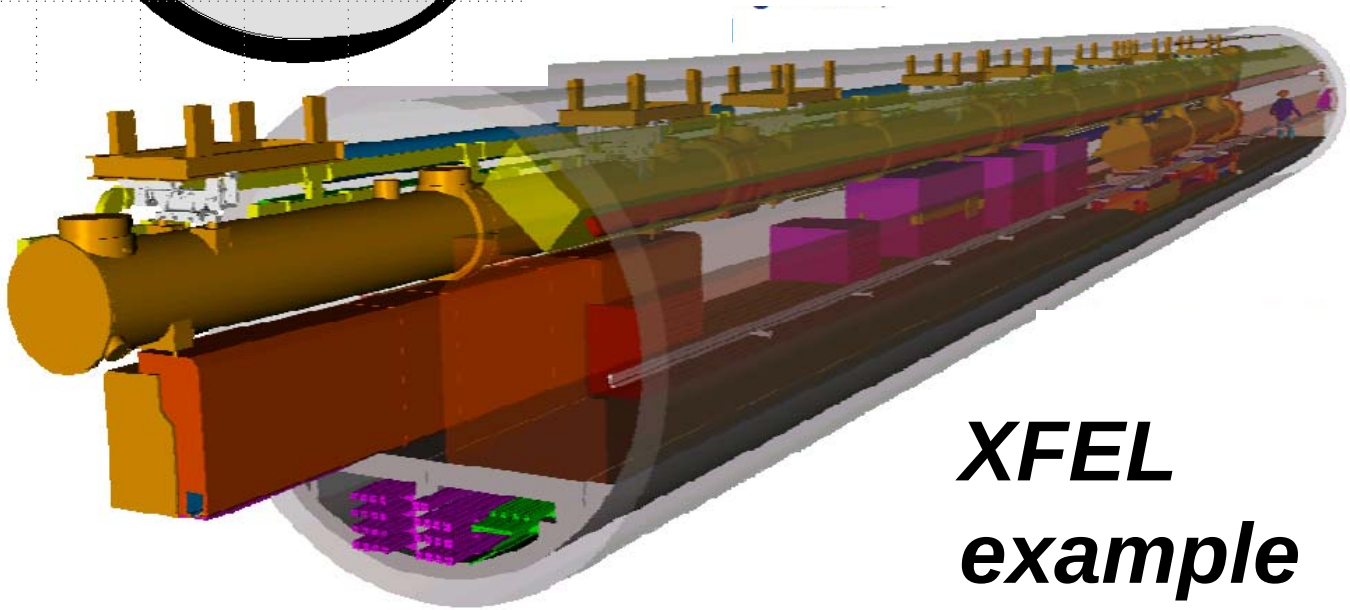



***CLIC VENTILATION ALTERNATIVES***



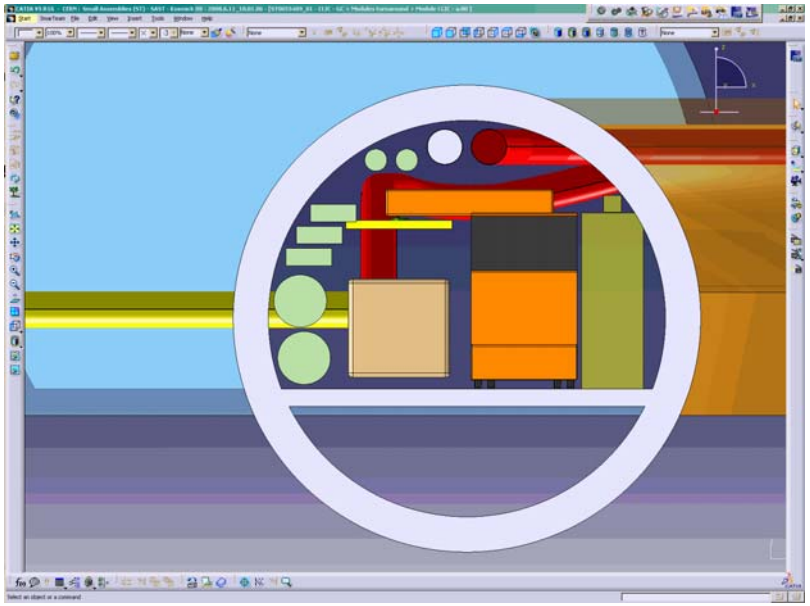




***mutual 3-D CAD Layout:***
***How does it all fit?***
***installation and serviceability***
***What is Optimal?***

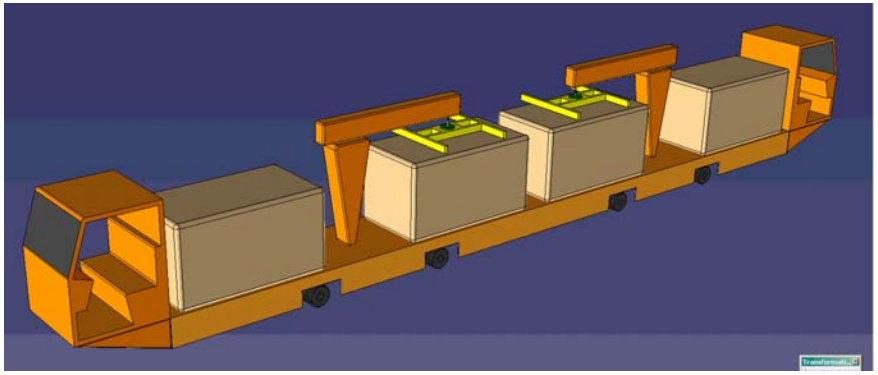


***XFEL example***

# EQ transport & install – Keith Kershaw (CERN)



assumed CLIC transport vehicles => study ***slopes***
e.g. for the Asian RDE site



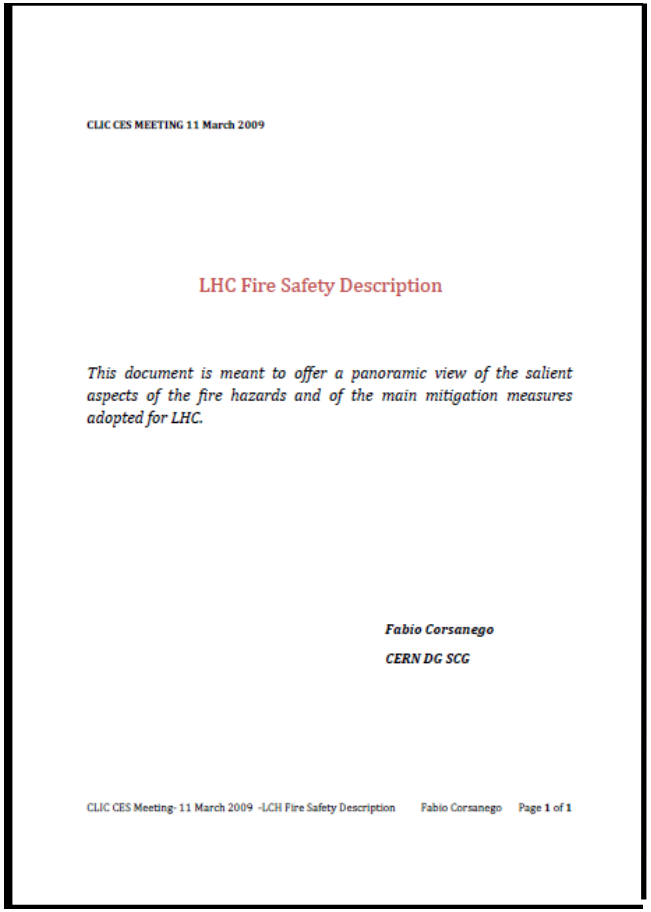
typical CLIC tunnel cross section

also J. Leibfritz (FNAL) and A. Enomoto (KEK)

**HERA installation**

# ILC / CLIC Joint Safety document

- Initial idea of having ‘a definitive safety note’ for a such a project to be built anywhere in the world is proving difficult
- It was agreed it would be better if this exercise was used more to collect safety data on similar projects that have been, or are currently under construction in the physics world eg LHC, XFEL, Project X etc.
- At CERN S.Weisz and F.Corsanego are starting this process by drafting the ‘LHC Chapter’
- KEK are producing a similar document for Fire Safety Issues



CLIC CES MEETING 11 March 2009

LHC Fire Safety Description

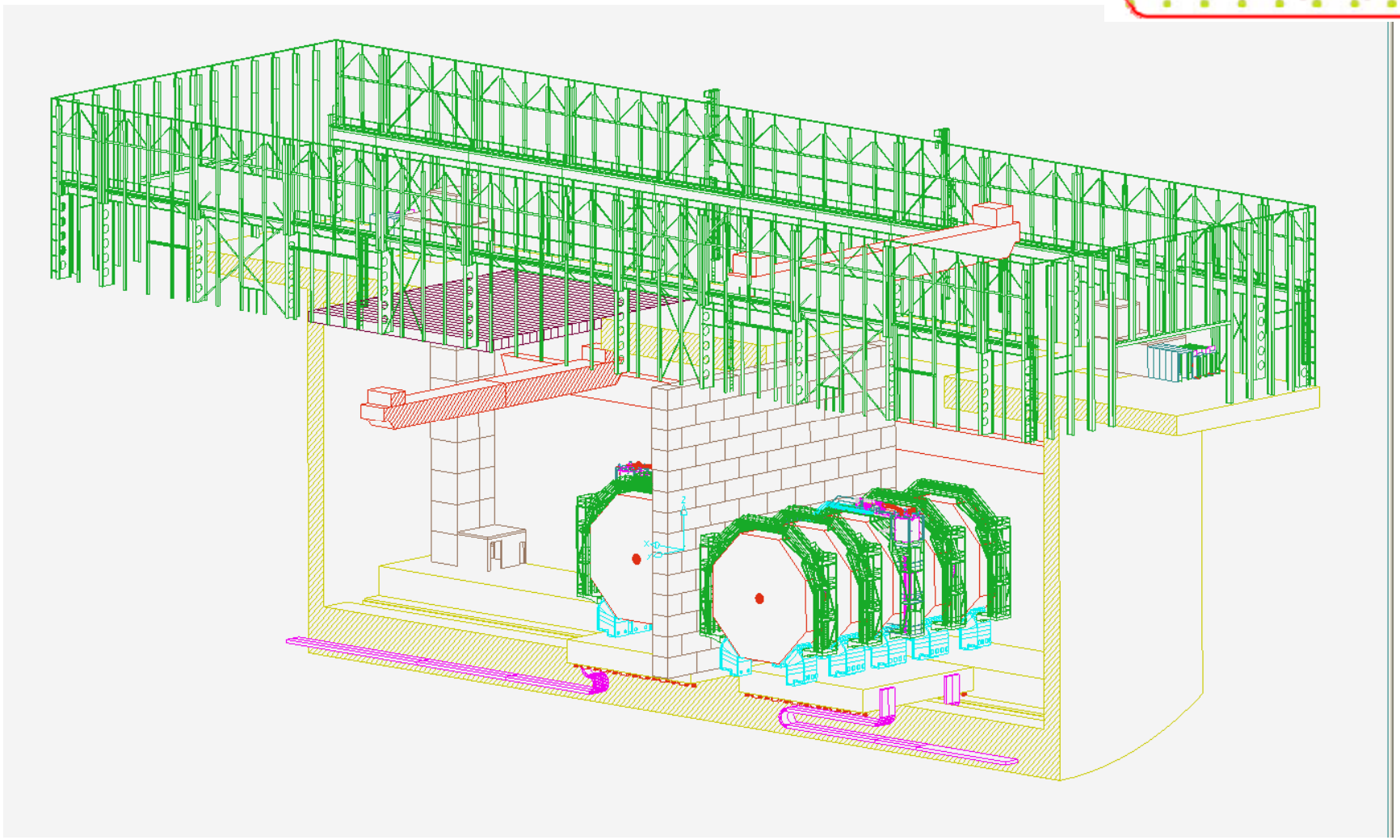
*This document is meant to offer a panoramic view of the salient aspects of the fire hazards and of the main mitigation measures adopted for LHC.*

*Fabio Corsanego*

*CERN DG SCG*

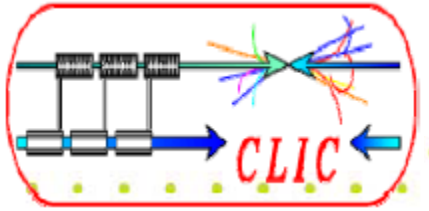
CLIC CES Meeting- 11 March 2009 -LCH Fire Safety Description Fabio Corsanego Page 1 of 1

# John Osborne – CERN – TILC09



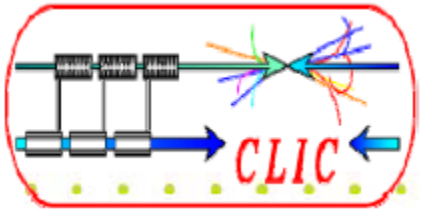
3d model of ‘shallow site’ Experimental Hall – e.g. Dubna Site

# CLIC-ILC Cost & Schdule WG




- **Participants:**
  - **CERN: G. Riddone, Ph. Lebrun, K. Foraz**
  - **ANL: J. Carwardine, FNAL: P. Garbincius**
  - **KEK: T. Shidara, DESY: F. Lehner <= *honorary member!***
  - **Also "graduates": CERN: H. Braun, S. Weisz**
- **Face-to-face meetings: also monthly teleconferences**
  - **Oct 07 – Fermilab - ALCPG07 – CLIC-ILC C&S WG kick-off**
  - **Feb 08 & May 08 – full CLIC/ILC Collaboration teleconferences**
  - **July 08 – Dubna – GDE Conventional Facilities & Siting**
  - **Oct 08 – CERN – CLIC Workshop**
  - **Nov 08 – Chicago – LCWS08**
  - **April 09 – Tsukuba – TILC09**

    Also participating: J.-P. Delahaye, E. Tsesmelis, C. Hauvillier, L. Rinolfi, N. Collomb, V. Kuchler, C. Adolphsen, W. Bialowons
  - **next: June 09 – CERN/CLIC - ILC/EC Meeting @ CERN**
- ***Nov 08 – gave ILC RDR est & info for BDS to CLIC***

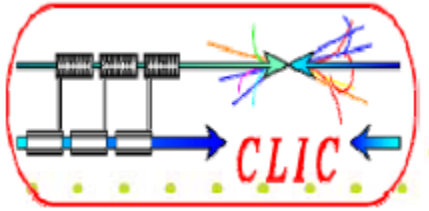



# CLIC Cost & Schedule Mandate

- Establish and optimize the **cost** of the CLIC complex at the nominal colliding beam energy of **3 TeV**, as well as that of an optional first phase with a colliding beam energy of **500 GeV**
- Define and optimize the general **schedule** for the 3 TeV and 500 GeV projects defined above
- Estimate the **electrical power consumption** of the 3 TeV and 500 GeV projects defined above
- Identify possible modifications of parameters and/or equipment leading to substantial capital and/or operational cost savings, in order to define **best compromise between performance and cost**
- Develop **collaboration with ILC** project on cost estimate methodology and cost of common or comparable systems, aiming at mutual transparency
- Document the process and conclusions in the **CDR in 2010**

***=> ILC C&S near-term goals: document RDR estimate in a DataBase and support the minimum machine optimization studies***

# *Draft* CLIC-ILC Cost &Schedule Working Group Mandate – May08




- Compare the **assumptions and methodology** adopted by both projects in matter of cost.
- Establish **functionalities for cost data analysis**:
  - Parametric cost models to define variation of costs as a function of the main parameters
  - Risk/uncertainty assessment.
- **Compare costs for certain items** (to be defined with the agreement of management) to better understand the difference subsystem by subsystem between the two technologies
- Develop ***common approaches*** to traceability, requirements, cost estimates, and the bases of estimates.
- Compare the basic **assumptions and baseline units for schedule**.

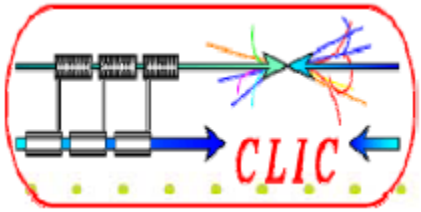
# ILC – RDR Estimate - PBS

## ILC - RDR Estimate - PBS (Parts Breakdown Structure)

| Level 1<br>Items (2) | | Level 2<br>Accelerator Area Systs (8) | | Level 3<br>Technical & Global Systs (12) | | Levels 4, 5, 6 …<br>Actual Cost Estimating Data |
|---|---|---|---|---|---|---|
| ILC Accelerator<br><br>ILC Experiments | → | Electron Source<br>Positron Source<br>Damping Rings<br>Rings to Main Linac<br>Main Linac<br>Beam Delivery Systems<br>Experimental Facilities<br>Common Infrastructure | X | Proj Mgmt & Admin Team<br>Conventional Facilities & Site<br>Cryomodules<br>RF Power Systems<br>Cryogenics<br>Controls<br>Installation<br>Instrumentation<br>Dumps & Collimators<br>Vacuum<br>Magnets & Power Supplies<br>Acceleartor Area Specific | X | Items (many)<br><br>sub-items (many)<br><br>sub-sub-items |

add another layer for sub-Area by Beam Deck?

depends on complexity of Level 2 and 3

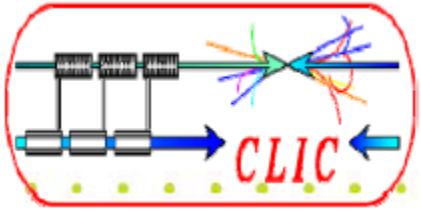



# CLIC Estimate – PBS – Dec08

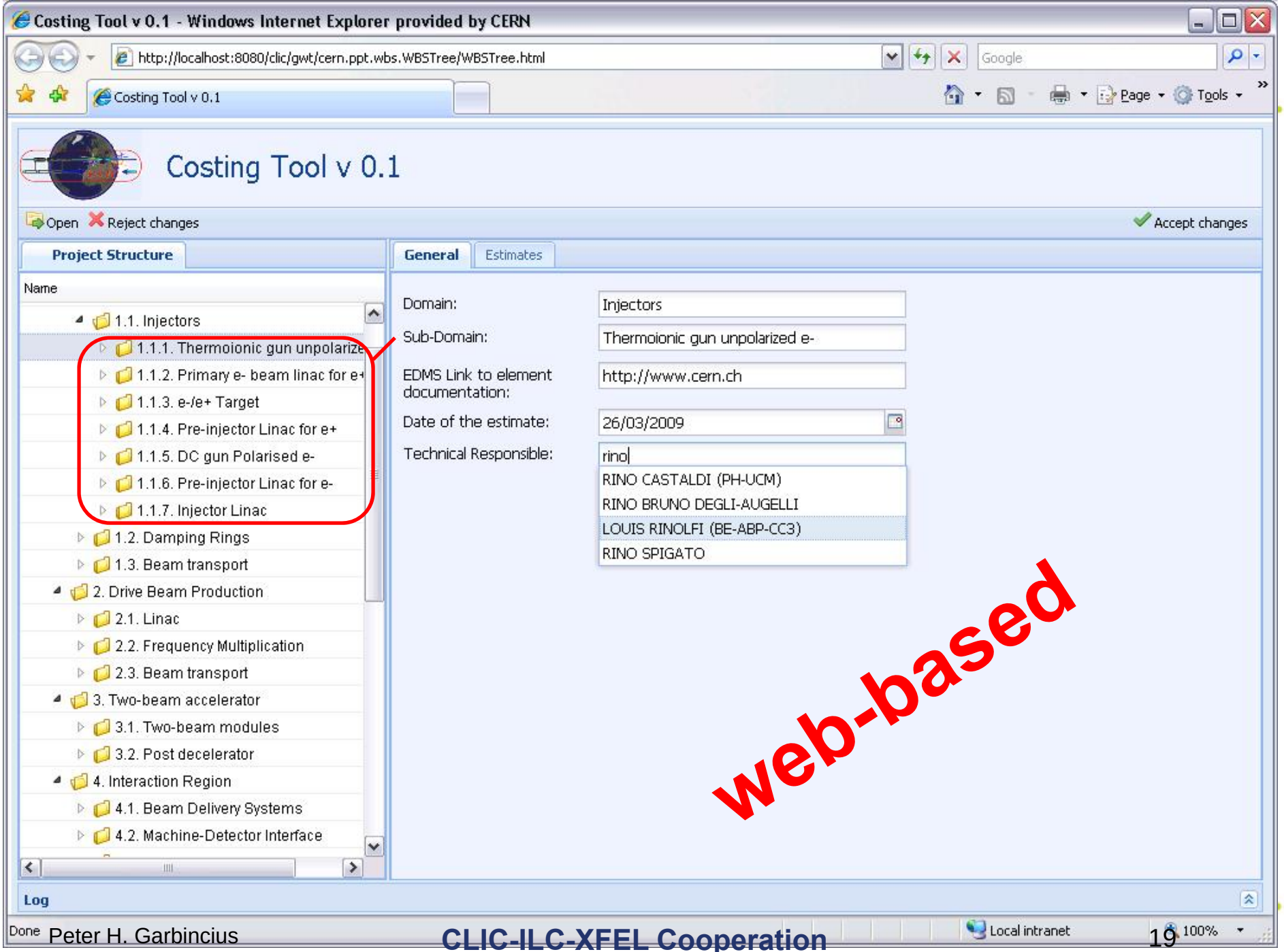
see CLIC cost template

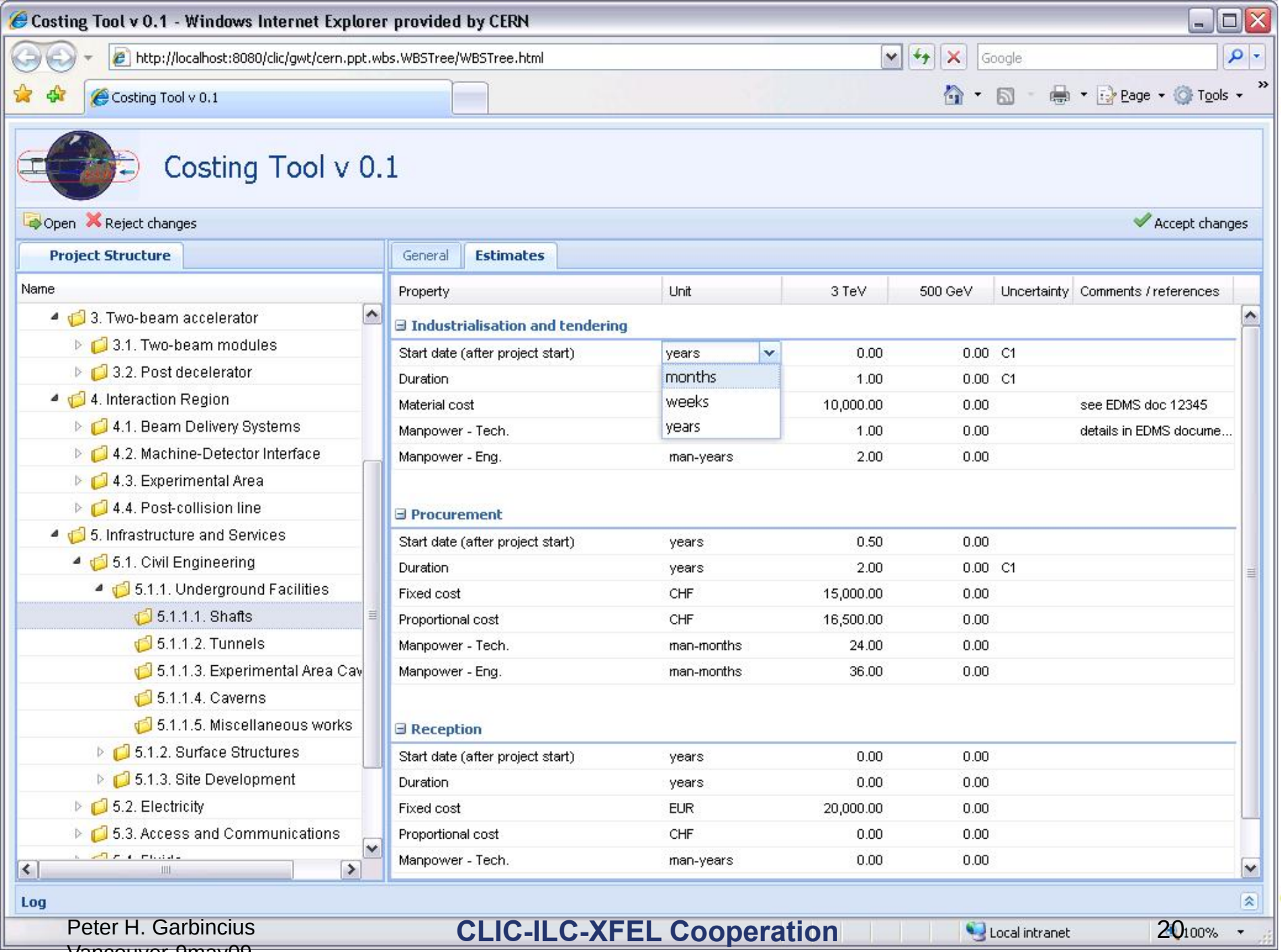
| Level 1 Beam & Services | Level 2 Area | Level 3 Sub-Areas | | Level 4 System (20) | | Level 5 Components |
|---|---|---|---|---|---|---|
| Main Beam | | | | RF System | | |
| | Injectors | 7 items | X | RF Powering Sys | X | not yet defined |
| | Damping Rings | 4 items | | Vacuum System | | |
| | Beam Transport | 11 items | | Magnet Powering Sys | | |
| | Linear Accelerators | 2 = e+/e- | | Magnet System | | |
| | Beam Delivery Sys | 2 = e+/e- | | Cooling System | | |
| | Post-Collision Beams | 2 = e+/e- | | Beam Instrumentation Sys | | |
| Drive Beam | | | | Supporting System | | |
| | Injectors | 2 = e+/e- | | Alignment System | | |
| | Frequency Mult. | 6= 3x2=e+/e- | | Kicker System | * | ILC RDR Estimate includes these under |
| | Beam Transport | 6= 3x2=e+/e- | | Cyrogenic System | | |
| | Linac Decelerator | 6= 3x2=e+/e- | | Laser System | * | Accel. Area Specific |
| | Dumps | 2 = e+/e- | | Collimation System | | |
| Interaction Region | | | | Stabilization System | | |
| | Machine-Detector Interface | 2 = A-B | | Absorbers | | |
| | Experimental Areas | 3 = A-B-Common | | Damping System | | |
| CE and Services | | | | Electron Gun | * | |
| | Civil Engineering | 3 items | | RF deflector | * | |
| | Electricity | 2 items | | Installation | | |
| | Access & Communications | 2 items | | Commissioning | → | not included in ILC RDR Estimate |
| | Fluids | 3 items | | | | |
| | Transport & Installation | 2 items | | | | |
| | Safety | 2 items | | | | |
| | Survey | 1 item | | | | |

# Cost Estimating Tools & Methods

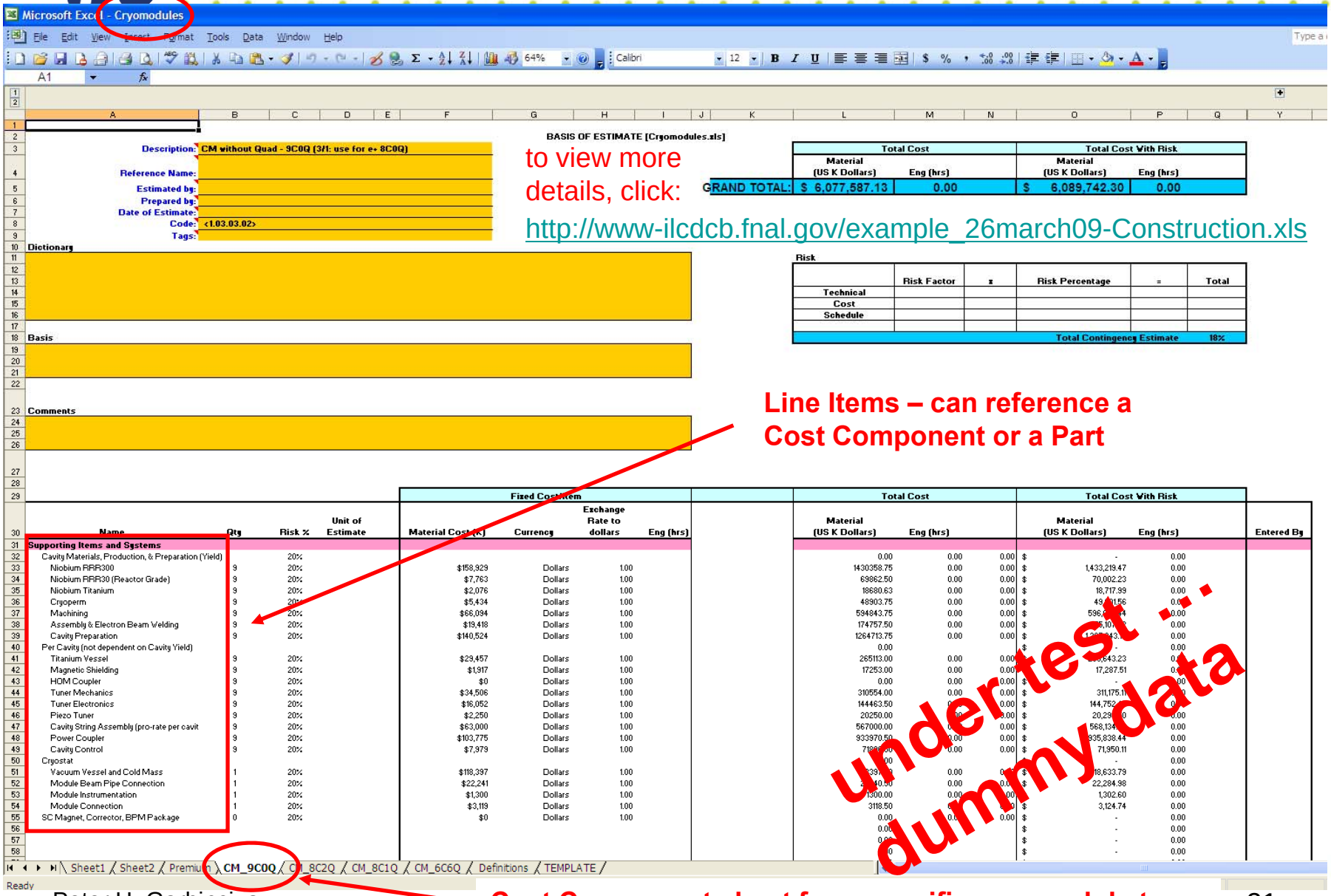



- ILC – using Triad Project Management, Inc.
  - **Developing ILC Cost Estimating Tool (ICET)**
    - WBS- linked Excel Cost Estimating Modules (CEMs)
    - mySQL DataBase => Reports
    - Store CEMs and Reports in ILC EDMS at DESY
- Differences with CLIC approach:
  - **CLIC has 3 TeV & 500 GeV estimates under each item**
  - **ILC does not include any scheduling information**
    - Triad believes this is better done in scheduling tool such as MS Project or Primavera which link back to ICET CEMs
  - **Under a given item's cost data, CLIC includes:**
    - industrialization and tendering, procurement, reception, installation, and commissioning
    - ILC includes these as separate items


Costing Tool v 0.1 - Windows Internet Explorer provided by CERN
http://localhost:8080/clic/gwt/cern.ppt.wbs.WBSTree/WBSTree.html
Costing Tool v 0.1
Costing Tool v 0.1
Open
Reject changes
Accept changes
Project Structure
General
Estimates
Name
1.1. Injectors
1.1.1. Thermoionic gun unpolarize
1.1.2. Primary e- beam linac for e+
1.1.3. e-/e+ Target
1.1.4. Pre-injector Linac for e+
1.1.5. DC gun Polarised e-
1.1.6. Pre-injector Linac for e-
1.1.7. Injector Linac
1.2. Damping Rings
1.3. Beam transport
2. Drive Beam Production
2.1. Linac
2.2. Frequency Multiplication
2.3. Beam transport
3. Two-beam accelerator
3.1. Two-beam modules
3.2. Post decelerator
4. Interaction Region
4.1. Beam Delivery Systems
4.2. Machine-Detector Interface
Domain:
Injectors
Sub-Domain:
Thermoionic gun unpolarized e-
EDMS Link to element documentation:
http://www.cern.ch
Date of the estimate:
26/03/2009
Technical Responsible:
rino
RINO CASTALDI (PH-UCM)
RINO BRUNO DEGLI-AUGELLI
LOUIS RINOLFI (BE-ABP-CC3)
RINO SPIGATO
web-based
Log
Done
Local intranet
100%


Costing Tool v 0.1 - Windows Internet Explorer provided by CERN
http://localhost:8080/clic/gwt/cern.ppt.wbs.WBSTree/WBSTree.html
Costing Tool v 0.1
Costing Tool v 0.1
Open
Reject changes
Accept changes
Project Structure
General
Estimates
Name
3. Two-beam accelerator
3.1. Two-beam modules
3.2. Post decelerator
4. Interaction Region
4.1. Beam Delivery Systems
4.2. Machine-Detector Interface
4.3. Experimental Area
4.4. Post-collision line
5. Infrastructure and Services
5.1. Civil Engineering
5.1.1. Underground Facilities
5.1.1.1. Shafts
5.1.1.2. Tunnels
5.1.1.3. Experimental Area Cav
5.1.1.4. Caverns
5.1.1.5. Miscellaneous works
5.1.2. Surface Structures
5.1.3. Site Development
5.2. Electricity
5.3. Access and Communications
Property
Unit
3 TeV
500 GeV
Uncertainty
Comments / references
Industrialisation and tendering
Start date (after project start)
years
0.00
0.00
C1
months
weeks
years
Duration
1.00
0.00
C1
Material cost
10,000.00
0.00
see EDMS doc 12345
Manpower - Tech.
1.00
0.00
details in EDMS docume...
Manpower - Eng.
man-years
2.00
0.00
Procurement
Start date (after project start)
years
0.50
0.00
Duration
years
2.00
0.00
C1
Fixed cost
CHF
15,000.00
0.00
Proportional cost
CHF
16,500.00
0.00
Manpower - Tech.
man-months
24.00
0.00
Manpower - Eng.
man-months
36.00
0.00
Reception
Start date (after project start)
years
0.00
0.00
Duration
years
0.00
0.00
Fixed cost
EUR
20,000.00
0.00
Proportional cost
CHF
0.00
0.00
Manpower - Tech.
man-years
0.00
0.00
Log
Local intranet
100%

# ICET Cost Estimate Module example




to view more details, click:

http://www-ilcdcb.fnal.gov/example_26march09-Construction.xls

**Line Items – can reference a Cost Component or a Part**

under test ... dummy data

**Cost Component sheet for a specific cryomodule type**

# Example of ICET Report – studying tags

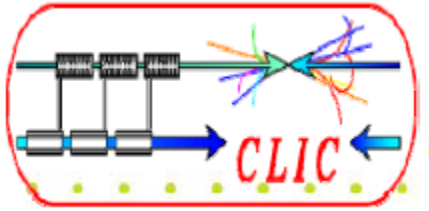
**atomic parts**

**Common parts from Cryomodules.xls**

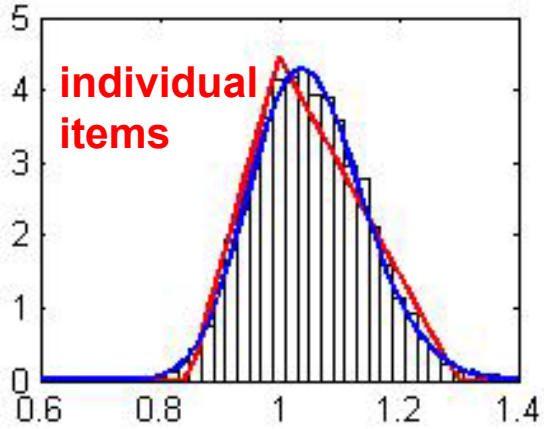
| WBS | Description | Materials (U | Qty | Region | Area | Tech & Global Sys |
|---|---|---|---|---|---|---|
| **1.02** | **Electron Source** | 33,192 | 1 | 0 | Electron Source | |
| 1.02.01 | electrons | 33,192 | 1 | 0 | | |
| 1.02.01.01 | electron part 1 | 8,192 | 1 | 8192 | Electron Source | Dumps & Collimators |
| 1.02.01.02 | electron part 2 | 0 | 1 | 0 | Electron Source | Magnets & Power Supplie |
| 1.02.01.03 | 8C1Q | 5,000 | 5 | 0 | Electron Source | Cryomodules |
| 1.02.01.03.01 | costs for 8C1Q | 1,000 | 1 | 1000 | | Cryomodules |
| 1.02.01.04 | 9C0Q | 20,000 | 10 | 0 | Electron Source | Cryomodules |
| 1.02.01.04.01 | costs for 9C0Q | 2,000 | 1 | 2000 | | Cryomodules |
| **1.03** | **Positron Source** | 50,000 | 1 | 0 | Positron Source | |
| 1.03.01 | positrons | 50,000 | 1 | 0 | | |
| 1.03.01.01 | a pot full of positron parts | 0 | 1 | 0 | Positron Source | Vacuum System |
| 1.03.01.02 | 8C1Q | 10,000 | 10 | 0 | Positron Source | Cryomodules |
| 1.03.01.02.01 | costs for 8C1Q | 1,000 | 1 | 1000 | | Cryomodules |
| 1.03.01.03 | 9C0Q | 40,000 | 20 | 0 | Positron Source | Cryomodules |
| 1.03.01.03.01 | costs for 9C0Q | 2,000 | 1 | 2000 | | Cryomodules |
| 1.04 | Damping Rings | 0 | 1 | 0 | Damping Rings | |
| 1.04.01 | rings | 0 | 1 | 0 | Damping Rings | |
| 1.05 | RTML | 0 | 1 | 0 | RTML | |
| 1.05.01 | turn-arounds | 0 | 1 | 0 | RTML | Construction (Conv. Facili |
| **1.06** | **Main Linac** | 2,500,000 | 1 | 0 | Main Linac | |
| 1.06.01 | Linacs | 2,500,000 | 1 | 0 | | |
| 1.06.01.01 | linac item 1 | 0 | 1 | 0 | Main Linac | Cryogenics |
| 1.06.01.02 | linac item 2 | 0 | 1 | 0 | Main Linac | RF Power System |
| 1.06.01.03 | 8C1Q | 500,000 | 500 | 0 | Main Linac | Cryomodules |
| 1.06.01.03.01 | costs for 8C1Q | 1,000 | 1 | 1000 | | Cryomodules |
| 1.06.01.04 | 9C0Q | 2,000,000 | 1000 | 0 | Main Linac | Cryomodules |
| 1.06.01.04.01 | costs for 9C0Q | 2,000 | 1 | 2000 | | Cryomodules |
| 1.07 | Beam Delivery System | 0 | 1 | 0 | Beam Delivery System | |
| 1.07.01 | deliveries | 0 | 1 | 0 | Beam Delivery System | Cryogenics |
| 1.08 | Experimental Facilities | 0 | 1 | 0 | Experimental Facilities | |
| 1.08.01 | experiments | 0 | 1 | 0 | Experimental Facilities | Installation |
| 1.09 | Common | 0 | 1 | 0 | Common | |
| 1.09.01 | commonalities | 0 | 1 | 0 | Common | Phase & Timing (?) |

under test ... dummy data

# Common Risk Document



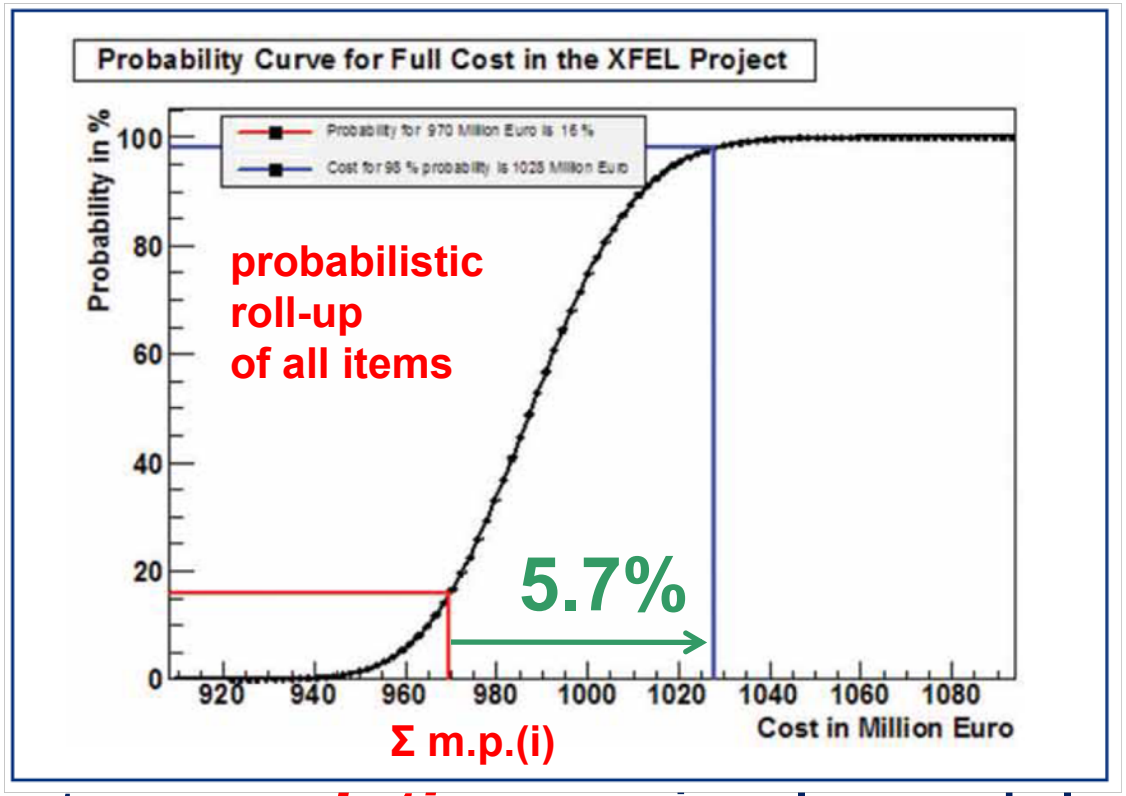

- Reviewed methods: XFEL & FAIR (Lehner), US DOE & ILC (PHG), LHC experience (Lebrun)




triangular &

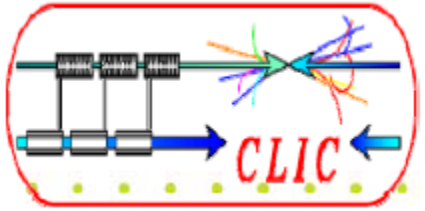
log-normal

distrbutions




- complications due to ***correlations*** - simple model or detailed understanding? => someone's life work!

# XFEL risk distributions:




triangular or log-normal distributions

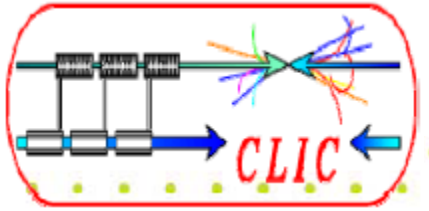
uncertainty range template based on maturity of estimate

similar for FAIR and US Dept. of Energy applications

## Standard cost uncertainty categories

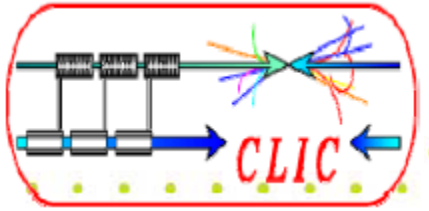
| Category | definition | lower/upper range |
|---|---|---|
| C1 | good experience and present price for this component/sub-system are available, no cost scaling for large quantities has been applied | -10% / +10% |
| C2 | experience and present price for similar components/sub-systems are available, no or only minor scaling to large quantities has been applied | -20% / +20% |
| C3 | present price is available, significant (>25%) cost scaling to large quantities has been applied | -10% / +20% |
| C4 | present price is available, price from industrial study is used which results in significant (>25%) cost reduction for production of large quantities | -10% / +20% |
| C5 | present price not available, price from industrial study is used | -10% / +20% |
| C6 | Required technology pushes state-of-the art, significant R&D still required | -10% / +50% |

# Risk – Ph. Lebrun – TILC09



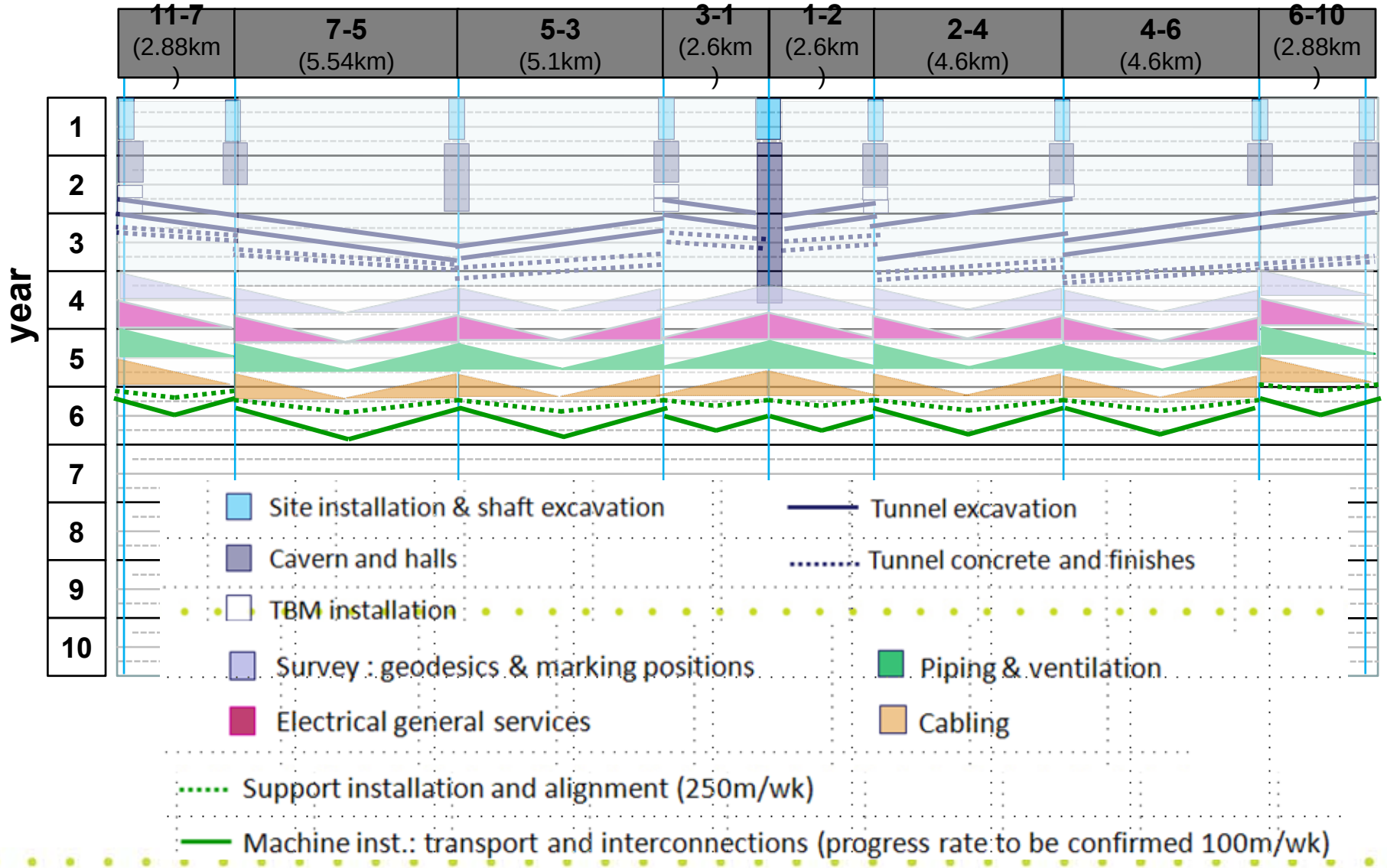

- Include in the probability distribution for tender price: technical risk in execution, evolution of the market, and commercial strategy of vendors
- Cannot address in a probabilistic manner: the evolution of design - use ***risk register*** method
- Don't address industrial price index & exchange rates which are deterministic multiplicative corrections
- What do individual countries' funding agencies expect, and what will they do with such risk info? Each country does it differently! It is difficult to have a single model which is globally applicable.
- Ph. Lebrun & G. Riddone – working on initial outline

# Common Scheduling Methodology
# MS Project => Primavera

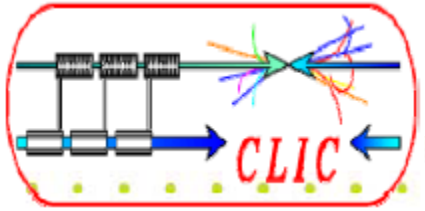



- Martin Gastal (CERN) did construction schedule in ILC RDR
- Katy Foraz (CERN) applied LEP-LHC experience & Amberg underground construction - added more details + installation
- Assumed unlimited resources (technically limited)
  - 9 TBMs – 120 m/wk excavation, 400 m/wk outfitting
  - # crews: 24 electrician, 12 cool & ventilate, 12 installation
  - all components available for installation when scheduled
- ***6 years*** - groundbreaking to installation complete
- more realistic manpower, e.g. ½ install crews => *8.5 years*
- ***How can commissioning vs. construction be optimized?***

# ILC - Machine installation

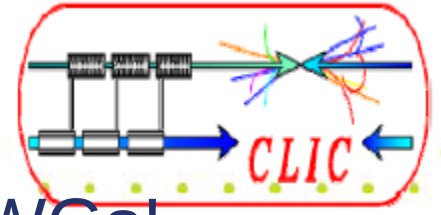


# our common plans - *Nov08*:




- ✓ CLIC-ILC Cost & Schedule Working Group WEBEX Meetings
  nominally 1400 GMT (1300 GMT summer) - 2nd Thursday of each month
- ✓ Keep work towards cost estimate mutually transparent
- ✓ Profit by synergies
- ✓ Understand and communicate the unavoidable differences in the methodologies used for the two projects
- ✓ Construction & installation schedules for CLIC & ILC w same methodology – 4/09
- Common ILC/CLIC notes (for mid '09)
  - x Tunnel safety underground compliance
    ***defer to:*** Fabio Corsenego and the ILC-CFS and CLIC-CES groups
  - x Standardization methods to estimate cost of warm magnets including cabling and power supplies – Braun & Garbincius started gathering materials, but international magnet fabrication experts ***– are just not available! - defer***
  - ✓ Description of cost risk assessment – Lebrun, Riddone, Lehner, Garbincius
    ***reviewed other applications, started developing outline at TILC09 – 4/09***

# After ~1 year's experience:

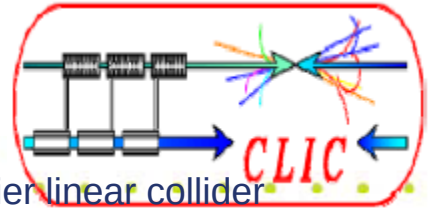



- Good progress made by CFS and C&S WGs!
- The Working Group Mandates need to be reviewed & renewed on an annual basis.

  This will be a topic a month from now at the

  Joint GDE-EC/CLIC Steering Committee meeting at CERN
- We chose a strategy to concentrate on a limited number of specific activities.
  A more inclusive approach is needed for certain *key items* – such as Cost & Schedule WG
- We should expand the 27oct08 'Joint Statements'
- We need to maintain effective resource management & communication channels

# references and links:




- ILC Director's Corner – Dec 13, 2007 – A more integrated approach to a frontier linear collider
- http://www.linearcollider.org/cms/?pid=1000465
- CLIC/ILC Collaboration Meeting – telconference – February 08
- http://indico.cern.ch/conferenceDisplay.py?confId=27435
- TILC08 – Sendai – March 08
  http://ilcagenda.linearcollider.org/conferenceOtherViews.py?view=standard&confId=2432
- CLIC/ILC Collaboration Meeting – telconference – May 08
  http://indico.cern.ch/conferenceDisplay.py?confId=32263
- GDE Conventional Facilities Meeting – Dubna – June 08
  http://ilcagenda.linearcollider.org/conferenceOtherViews.py?view=standard&confId=2321
- CLIC Workshop – CERN – Oct 08 http://indico.cern.ch/conferenceTimeTable.py?confId=30383
- ILC Director's Corner – November 13, 2008 – Joint Statements of 27oct08
  http://www.linearcollider.org/cms/?pid=1000592 also http://www.nature.com/nature/journal/v456/n7221/full/456422a.html
- LCWS08 & ILC08 – Chicago – Nov08
  http://ilcagenda.linearcollider.org/conferenceOtherViews.py?confId=2628&view=standard&showDate=all&showSession=all&detailLevel=contribution
- TILC09 – Tsukuba – April 09
  http://ilcagenda.linearcollider.org/conferenceOtherViews.py?view=standard&confId=3154

- Many thanks to the following: J.-P. Delahaye, J. Osborne, V. Kuchler, L. Hagge, K. Kershaw, F. Corsenego, G. Riddone, Ph. Lebrun, K. Foraz, J. Carwardine

***and thank you too!*** you can search for their contributions in the references above