

# Project Cost Basis and Schedule Summary

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LCWS12

# Cost and schedule summary

## Presentations:

- ILC Cost Methodology (15)- G. Dugan
- ILC Cost Basis (15) – G. Dugan
- ILC Schedule (15) – E. Patterson (slides from M. Gastal)
- CLIC Schedule and Cost (45) – P. Lebrun
  
- This summary:
  - Common features: scope, methodology
  - ILC specific: Escalated RDR Value, schedule
  - CLIC specific: 500 GeV scenarios, CDR Value, schedule

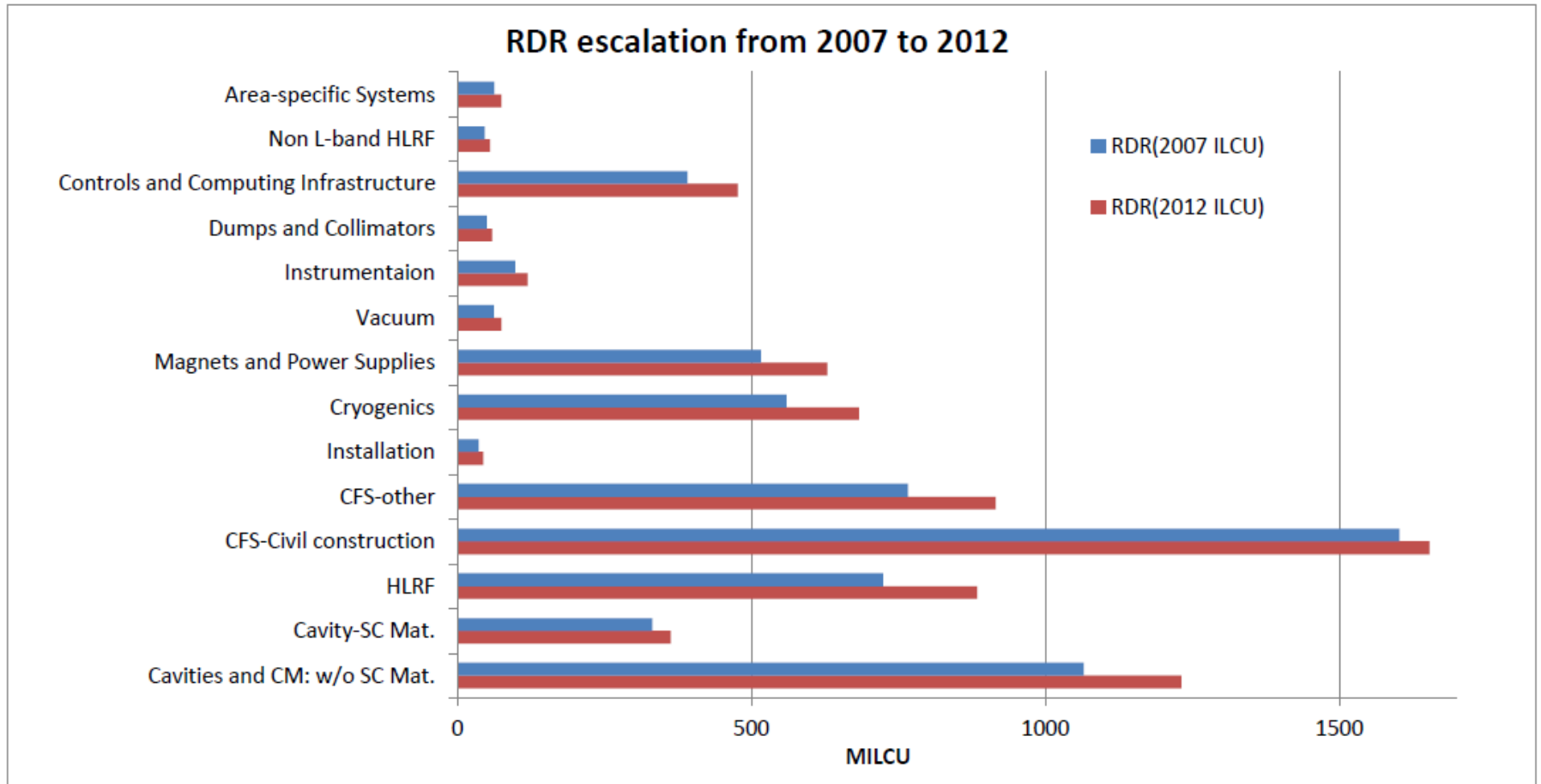
# Scope of the estimates

- Included in ILC TDR:
  - The cost estimate covers only the construction cost for the 500 GeV accelerator systems as detailed in the TDR.
  - Costs for upgrading the machine to 1 TeV are not included, except the cost of those systems which would be very difficult to provide after construction of the 500 GeV machine (e.g., beam dumps, BDS length).
- Included in CLIC CDR:
  - The basic parameters for the CLIC CDR study are optimized for a collision energy of 3 TeV and a peak luminosity of  $2 \text{ E}34 \text{ cm}^{-2} \text{ s}^{-1}$
  - The study includes a first stage at 500 GeV, for which a single drive-beam production complex is sufficient to power both main linacs.
  - Two staging scenarios have been studied and costed.
- Not included in either estimate:
  - Detectors, project engineering, design, and R&D prior to construction authorization, beam commissioning, pre-operation, operation, de-commissioning, taxes, contingency, and escalation during project construction.
  - Also excluded in CLIC estimate: computing, general lab services and administration

# Value Estimating Methodology and Costs

- Both estimates use the Value estimating methodology:
  - The Value of a component is defined as the lowest reasonable estimate of the procurement cost of an item with the required specification, and in the appropriate quantity, based on production costs in a major industrial nation.
  - The Labor associated with a component or activity is defined as “explicit” labor, which may be provided by the collaborating laboratories and institutions, or may be purchased from industrial firms.
- The currency unit used for CLIC Value is CHF (Dec. 2010). Conversions from costs estimated in other currencies are done on the basis of exchange rates.
- The currency unit used for ILC Value is USD (Jan. 2012) (“ILCU”). Conversions from costs estimated in other currencies are done on the basis of OECD purchasing power parity indices.
- The CLIC CDR has a published cost.
- The ILC TDR cost is still in the review process. However, for reference, the RDR costs can be re-stated in terms of 2012 USD (“ILCU”).

# ILC RDR Value estimate, re-stated in 2012 ILCU

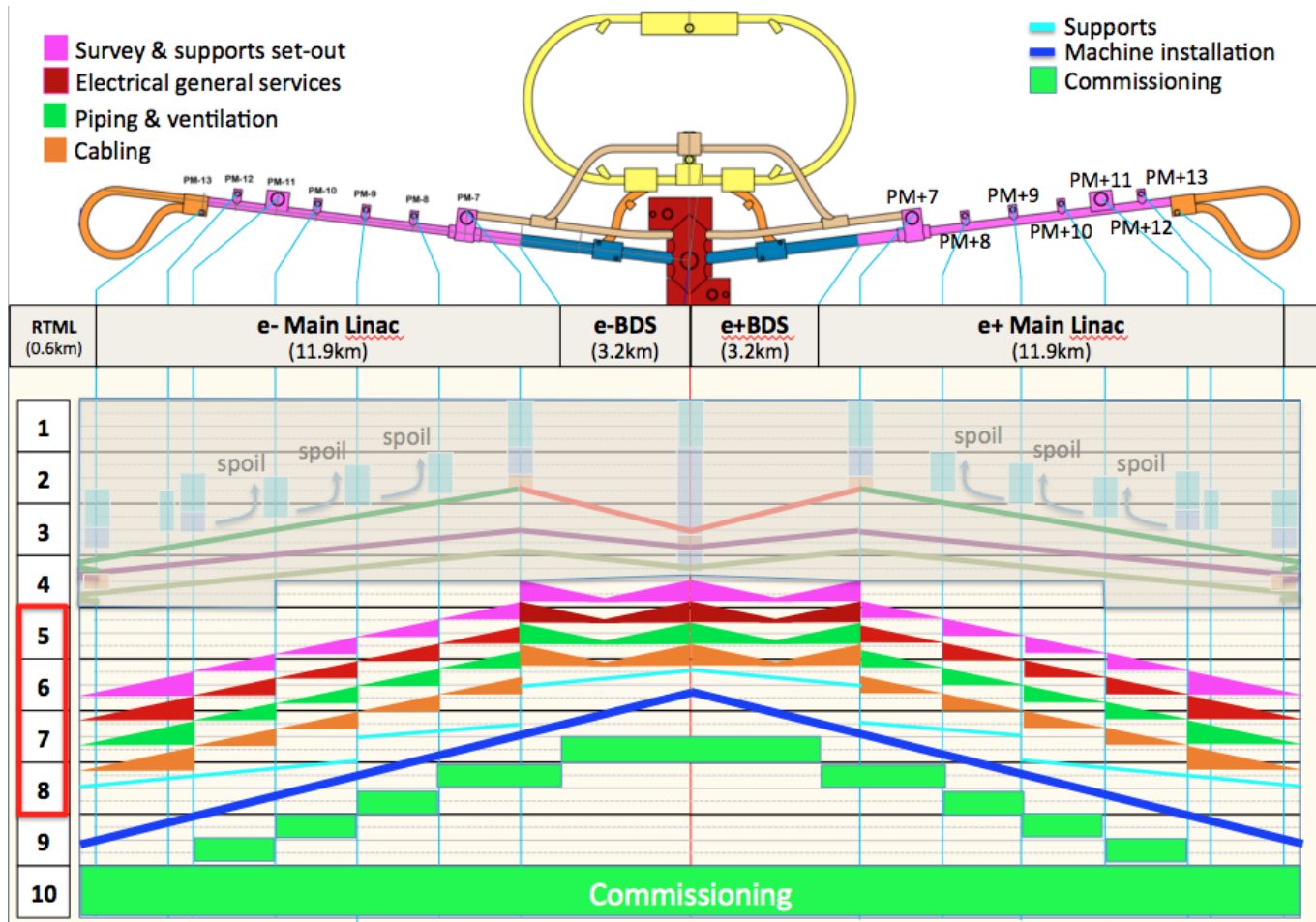


Total ILC RDR estimate: 7268 MILCU (2012).  
6312 MILCU (2007).

Explicit Labor: 14,200 FTE-years

Average escalation: 15%

# Flat Topography ILC schedule





# Scope of the CLIC CDR study

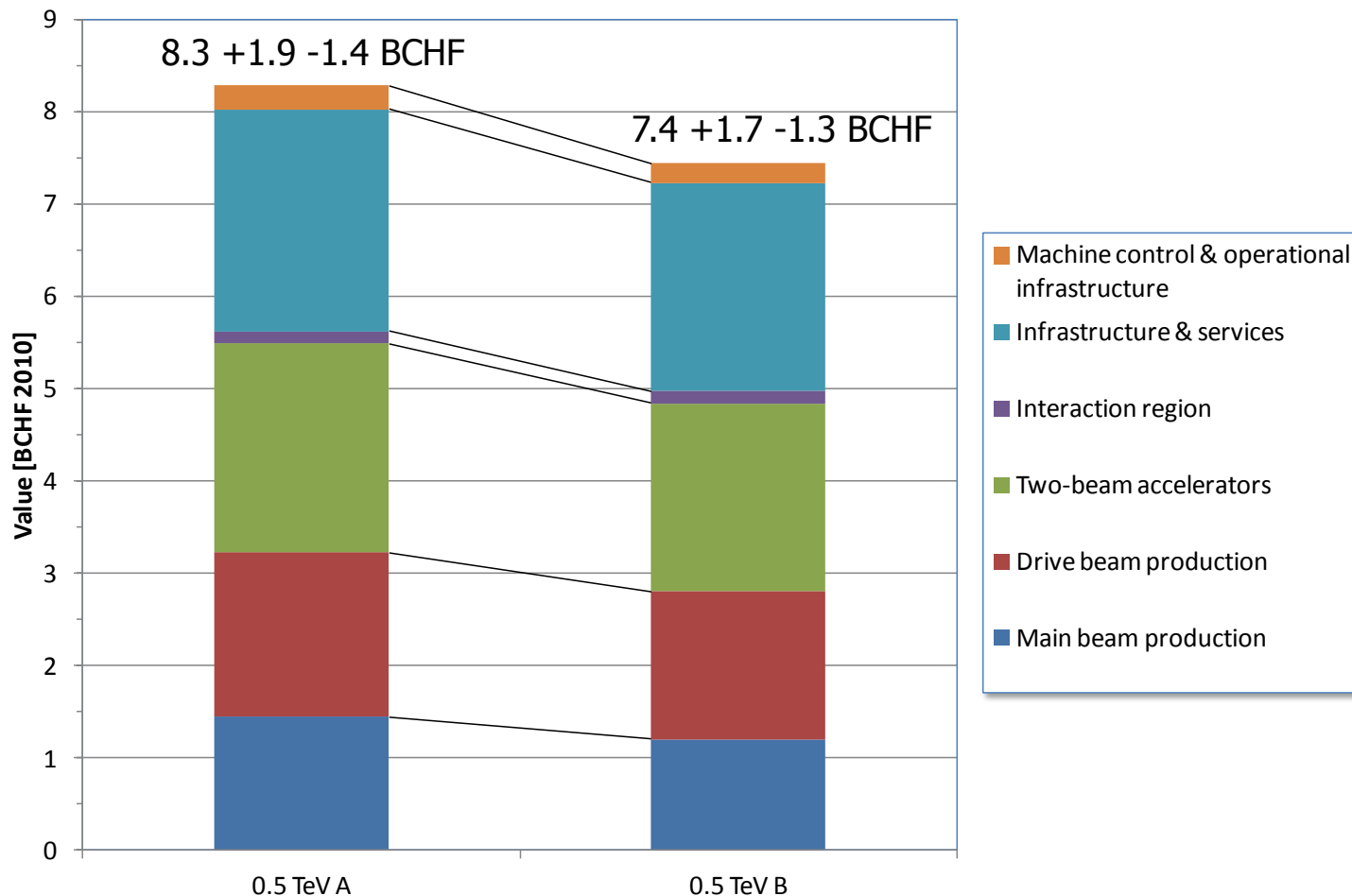
## Changes in CDR Volume 3 [3/3]



- Two alternative staging scenarios
  - Each with three stages: 500 GeV, ~1.5 TeV and 3 TeV
  - Scenario A: « optimized for luminosity in the first stage »
  - Scenario B: « optimized for lower entry cost »
  - First and last stages of scenario A are identical to CDR Volume 1
  - Reuse of 80 MV/m structures in scenario A limits the energy of the second stage to 1.4 TeV
  - Scenario B has nominal bunch charge at all stages, resulting in
    - Use of final (100 MV/m) gradient structures already at 500 GeV
    - Shorter main linacs (2 x 4 sectors)
    - Lower installed RF power in the main-beam and drive-beam production complexes



# CLIC Value by PBS/WBS domain



Labor: Scaling to CLIC @ 500 GeV

Assume Person/Material ratio is the same as for LHC construction

Scenario A

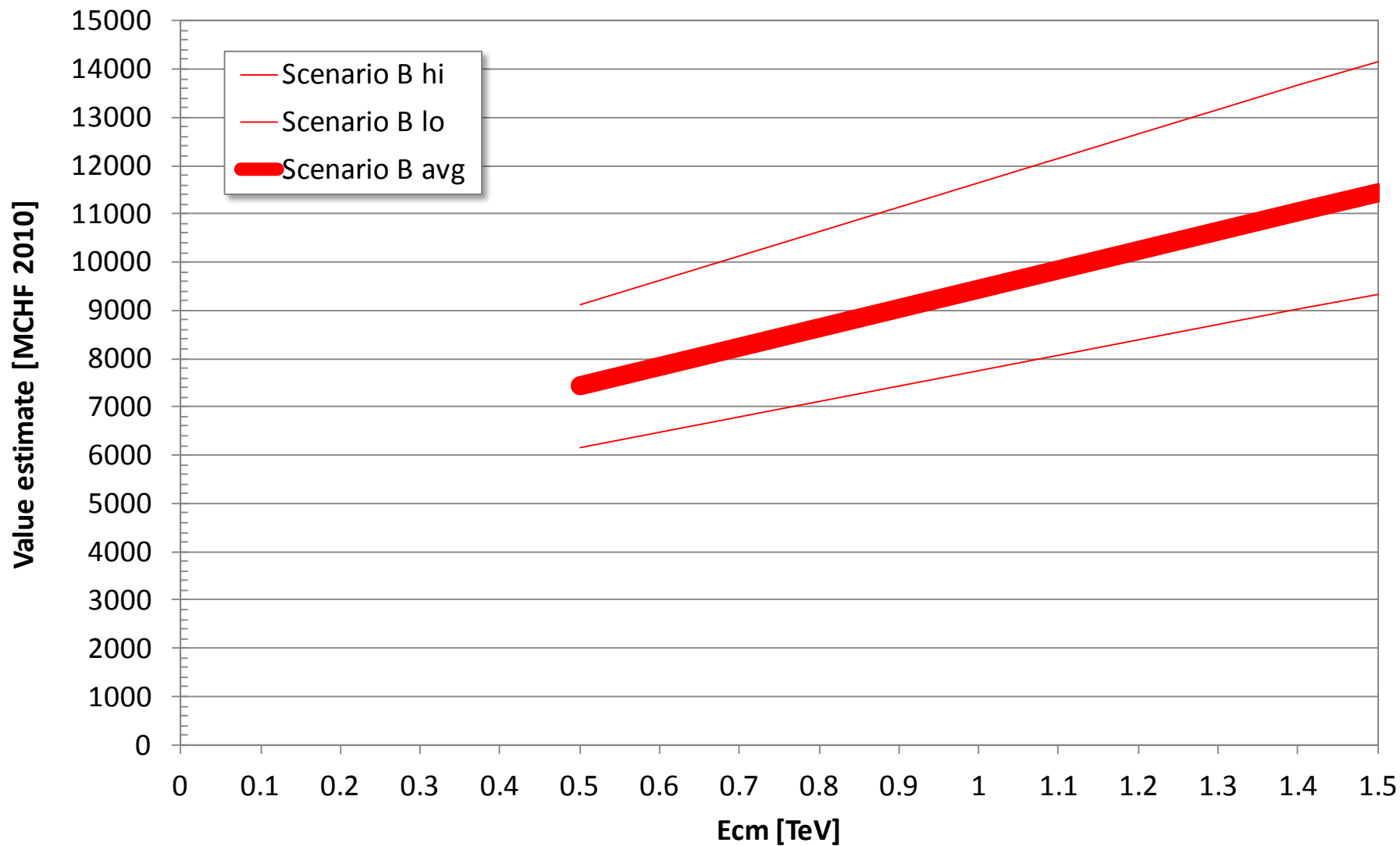
15700 FTE.years

Scenario B

14100 FTE.years



### Value estimate of CLIC vs Ecm

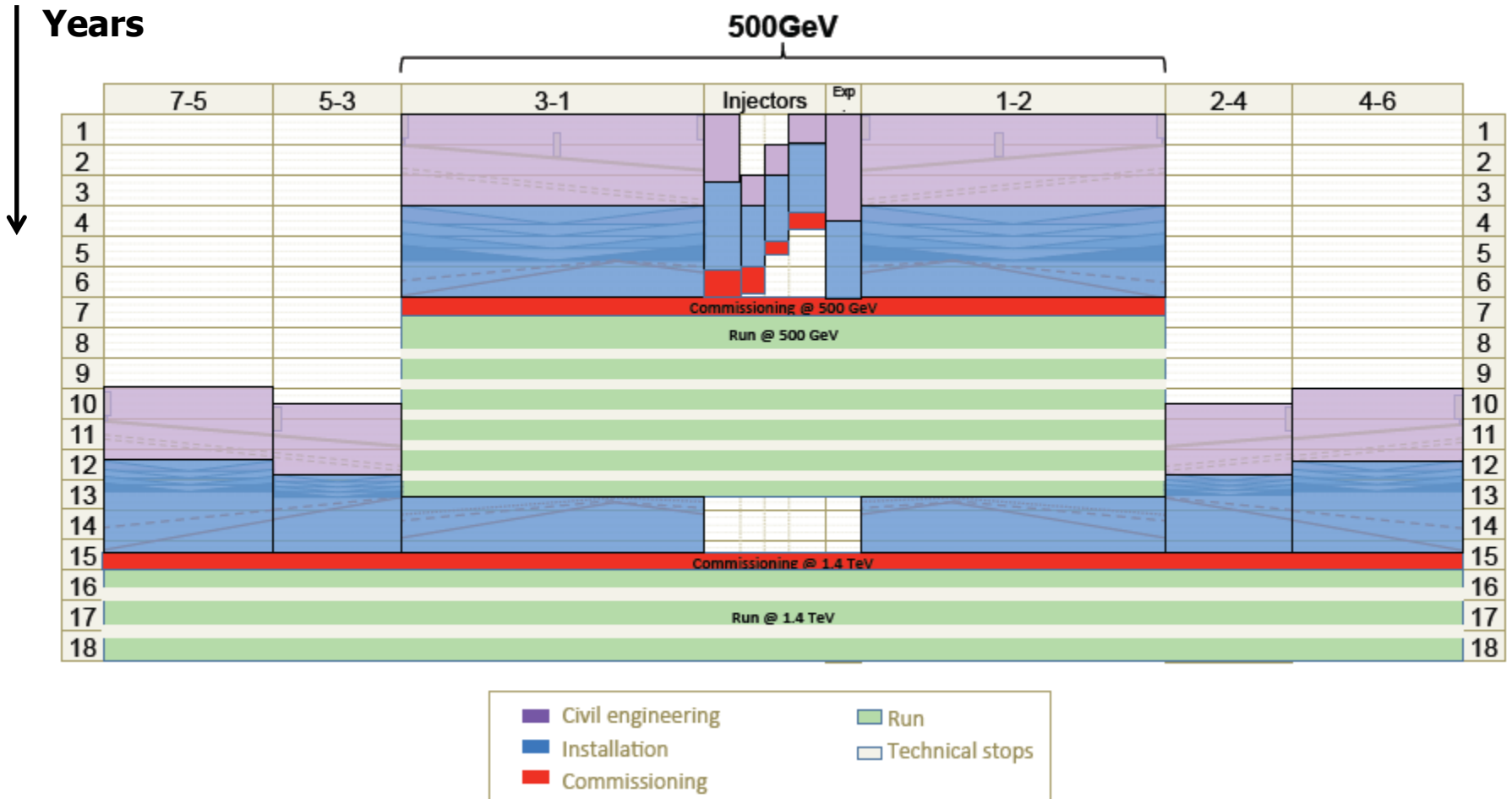




# Overall CLIC construction schedule - Scenario A



K. Foraz



# Conclusions

- Both ILC and CLIC cost estimates have similar generic scope definitions and both use the value estimating methodology.
- ILC TDR cost estimate not yet available
  - Escalated RDR is 7.3 BUSD (2012) + 14,200 FTE-years.
  - Schedule: 9 years from project start to beam commissioning
- CLIC CDR cost estimate published
  - 500 GeV scenario A: 8.3 +1.9 -1.4 BCHF (2011) +15,700 FTE-years
  - 500 GeV scenario B: 7.4 +1.7 -1.3 BCHF (2011) +14,100 FTE-years
  - Schedule: 6 years from project start to beam commissioning
  - Scaled value for CLIC at 1.5 TeV CM gives access to incremental cost above 500 GeV of  $\sim 4$  MCHF/GeV CM