



ILC detector R&D – new organisation

Chris Damerell
RAL

On behalf of the ILC Detector R&D Panel
(a Panel of the World-Wide Study Organising Committee)

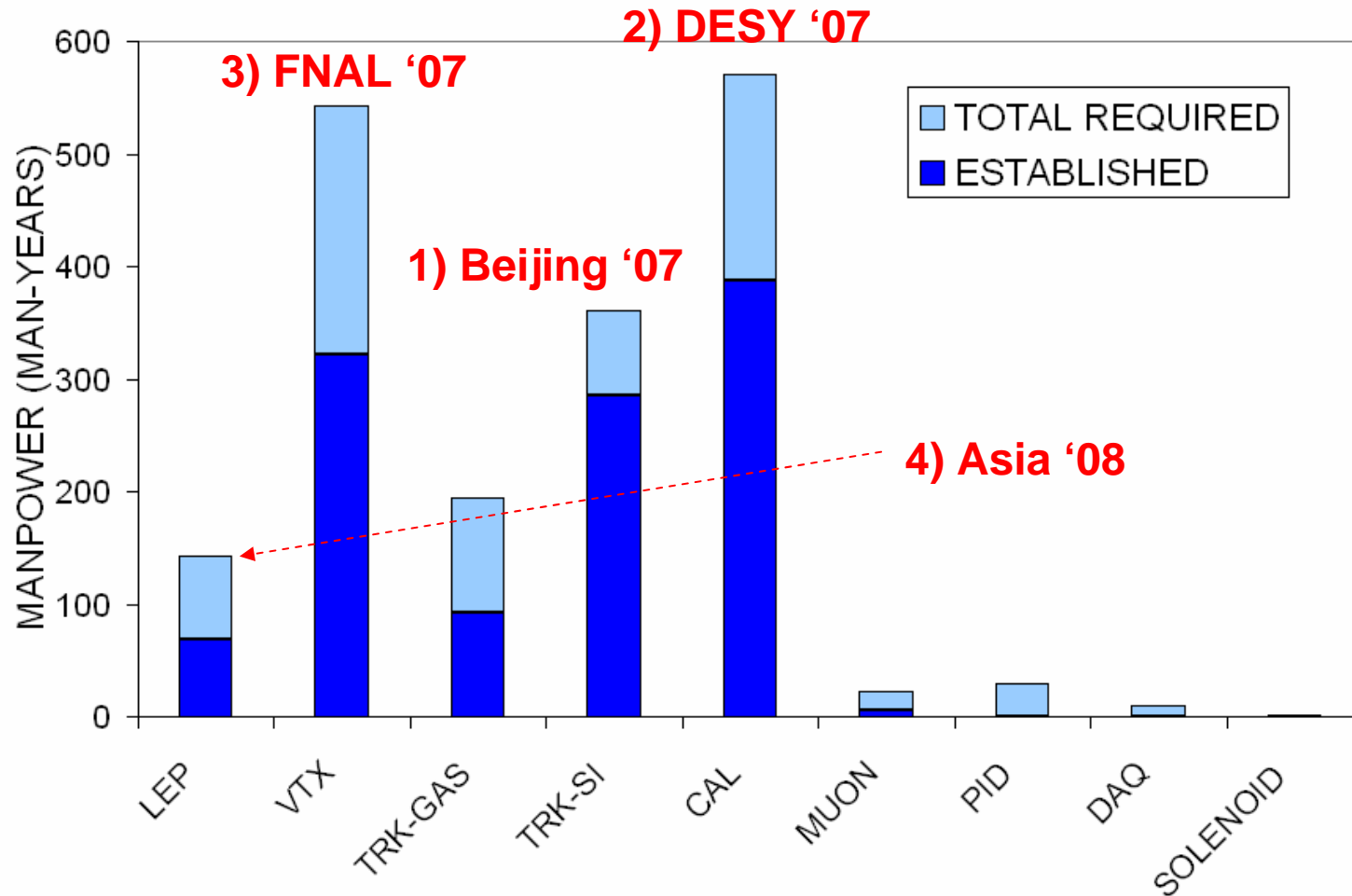
(Jean-Claude Brient, Chris Damerell, Ray Frey, Dean Karlen, HongJoo Kim, Wolfgang Lohmann, Yasuhiro Sugimoto, Tohru Takeshita, Harry Weerts)



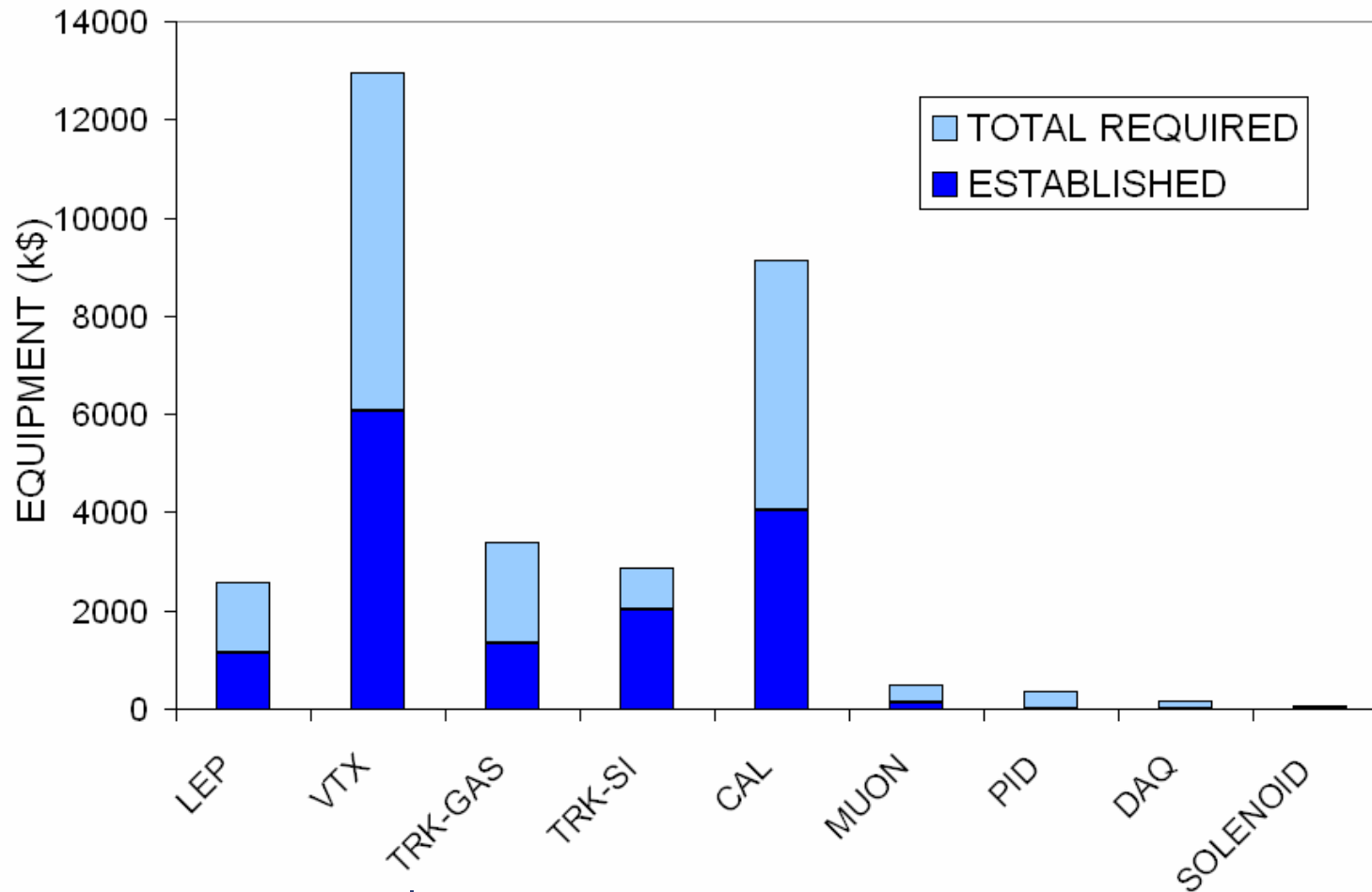
- Our first task, after formation in March 2005, was to document world-wide activities
- Panel website at <https://wiki.lepp.cornell.edu/ilc/bin/view/Public/WWS> provides a page for every R&D project at end 2005. Groups are encouraged to provide updates
- We produced a document '*Status Report and Urgent Requirements for Funding*', 6 Jan 2006
- This indicated ~ \$33M p.a. established, ~ \$55M p.a. required for timely completion of the urgent R&D programme
- **'urgent needs' or 'unrestrained desires'?**



Totals over 3-5 yrs, to completion of R&D



1163 man-yrs established, 1873 man-yrs required



\$14.7M established, \$32.0M required

(adds 15% to manpower costs, assuming \$100k p.a. average for staff)



- All groups are of course subject to **national** peer review, and in many cases there are effective **regional** review procedures (eg the DESY PRC)
- Do these suffice? There are some concerns about missing items, unnecessary duplication, work 'only of academic interest', and R&D groups in some cases not being fully connected to the fast-moving international picture
- **We can all think of examples ...**
- Meanwhile, the ILC accelerator community, through the RDB, has organised **world-wide task forces**, designed to optimise their R&D activities
- Partly in response, the WWS-OC, supported by the GDE-EC, decided to initiate **world-wide detector R&D reviews** (discussed in Vancouver in July, and announced to the community on 20 October)



Purpose of these reviews

- First and foremost, to get representatives of all R&D groups together for face-to-face discussions
- Secondly, our consultants, being outside the ILC community, will surely provide new insights
- The *self-organising abilities* of our community will lead to refinements in the world-wide R&D programme
- Ideally, the committee report will do little more than document these *mutually agreed* changes
- *“If you don’t have buy-in, you can’t effect change.”*



Overview of these reviews

- To be included in regional workshops:
 - Beijing (Feb '07) **Tracking**
 - DESY (LCWS June '07) **Calorimetry**
 - Fermilab (Oct '07) **Vertexing**
 - Asia (tbd 2008) **PID, muon trkg, solenoid, beam diagnostics, DAQ**
- Appoint a review committee composed of Panel members, RDB members, consultants and workshop coordinators
- Cycle through R&D areas every 16 mo, **but each committee can reconvene by phone on request**, for example to review of a new proposal (corresponding to one of the functions of the RDB)
- Transfer responsibility for reviewing R&D when groups become absorbed in detector collaborations (as happened at LHC)



Plans for Tracking Review in Beijing

- Request written reports from collaborations (LC-TPC and SiLC), and independent tracking groups, outlining their R&D programmes with milestones passed, and future milestones, up to completion of *development* – ready for production
- This will encourage urgent attention to system aspects
- Request funding information (**confidential, for closed session discussion only**) for their current programme, in the form of a table relating R&D topics to groups and countries (as already provided for our Panel report)
- Also make a general estimate of their future needs to completion
- Request open session presentations structured as they prefer, but most logically talks by work package leaders for each main R&D topic
- Clarify the funding info request with an example, since this seems to have created some confusion ...



Collaboration X: Current programme; FTEs/\$k p.a.

Country	Group	Topic				TOTALS	
		sensors	electronics	mechanics	alignment	group	country
Albania	NameA		3.5/21		2.0/12	5.5/33	10.5/43
	NameB	5.0/10				5.0/10	
Belgium	NameC			2.5/15	1.0/10	3.5/25	17.5/93
	NameD		3.5/21		2.0/12	5.5/33	
	NameE	5.0/10				5.0/10	
	NameF			2.5/15	1.0/10	3.5/25	
Canada	NameG		3.5/21		2.0/12	5.5/33	14.0/68
	NameH	5.0/10				5.0/10	
	NameI			2.5/15	1.0/10	3.5/25	
Denmark	NameJ		3.5/21		2.0/12	5.5/33	10.5/43
	NameK	5.0/10				5.0/10	
Ethiopia	NameL			2.5/15	1.0/10	3.5/25	3.5/25
EUDET		7.5/15				7.5/15	7.5/15
TOTALS		27.5/55	14.0/84	10.0/60	12.0/88	63.5/287	63.5/287



- **Collaborations** will generally wish to present their work by topic or work package (one section of their report per topic, and maybe one talk per major topic)
- There may be some exceptions; say Group L from Ethiopia is doing some major independent work on alignment, and wants to present this separately
- **Funding agencies** will generally wish to see the breakdown by institutions and countries
- We leave it to the collaborations (LC-TPC and SiLC) to decide how to present their work. **As long as they provide this table in their confidential written report, for discussion only in the closed sessions, everyone will have what they need**
- Separate R&D groups will simply provide a 1-row table, to indicate how their resources are distributed between topics



ILC tracking activities (from Panel web page)

- **Collaborations**
 - LC-TPC (Settles)
 - SiLC (Savoy-Navarro)
- **Independent groups**
 - LBNL, UC Berkeley, UC Davis (Battaglia)
 - Louisiana Tech (Sawyer)

 - Brown U (Partridge)
 - U Colorado (Wagner)
 - Kansas State, Bonn U (von Toerne)
 - Purdue U (Bortoletto)
 - SLAC-Fermilab (Nelson)
- **There are surely others, since end of 2005. Please get in touch immediately!**
- **Question of threshold for reports and presentations ...**



- Tracking Review Committee (18 members):
 - Panel members (**Damerell, Karlen, Kim, Lohmann, Weerts**)
 - RDB members (**Elsen, Himel, Willis**)
 - Consultants (**Braun-Munzinger, Giomataris, Sauli, Hamagaki, Heijne, Sadrozinski, Spieler, Unno**)
 - 2 tracking organisers from Beijing workshop (**Li Weiguo will select them**)
- Review procedure:
 - **Day 1 (4th Feb '07) Workshop plenaries**
 - **Day 2 Open Session, TPC in morning, silicon in afternoon, dinner together in evening**
 - **Day 3 Closed Session, discussions with group/collab reps**
 - **Day 4 morning, draft committee report; afternoon, discuss this with group/collab reps**
 - **Complete committee report within 2 weeks. Distribute this and group reports to: Groups, WWS-OC, GDE EC and FALC**



Beware of missing 'big issues'

- Some critical questions could lie in the cracks *between* our list of topics
- For example, what is the risk of ILC occasionally delivering the dreaded '**fliers**', seen when SLC was behaving badly
- Errant bunch, at maybe 0.01 Hz or 0.001 Hz
- Characterised by a shower of off-axis particles (electrons and/or muons) (maybe 0.1% of the bunch) that traverse the tracking system
- Such a massive pulse of electric charge could effectively short out a gaseous tracking detector, causing the main high voltage to trip off
- Such fliers are of little interest to the accelerator people, since the effect on delivered luminosity is negligible
- However, they would effectively disable a detector system that utilises gaseous tracking detectors
- **Should we request a talk on this, or is ILC 'guaranteed' to be immune to such problems?**



Details to be settled soon

- How to pay expenses of our consultants?
- Identify groups that aren't members of SiLC or LC-TPC, and aren't on our website – they need to act fast
- Issue guidelines for collaboration/group reports. Reports and slides of talks to be sent to us by 29th Jan
- Admin support – excellent help currently from GDE (Maxine Hroneck et al), and additional support promised during the review



Conclusions and Hopes

- These reviews will provide an excellent opportunity to optimise the world-wide R&D for ILC detectors
- Progress can only be made by agreement - if people don't buy in to the committee recommendations, they won't happen
- Despite being reviewed almost to death, were the LHC first-generation detectors fully optimised? **[Some systems are being replaced or drastically revised in upgrade plans – should any of these have been realised in time for startup?]**
- Shortcomings in MDI and detector design at LEP and SLD did reduce the physics output – maybe dramatically ... Were any of these avoidable, other than with hindsight?
- **With our world-wide R&D network, we can aim for unprecedented detector performance at ILC, matched to the complex physics challenges. *These reviews can help achieve our ambitious goals***