



# Status of the ILC

Brian Foster (Oxford & GDE)

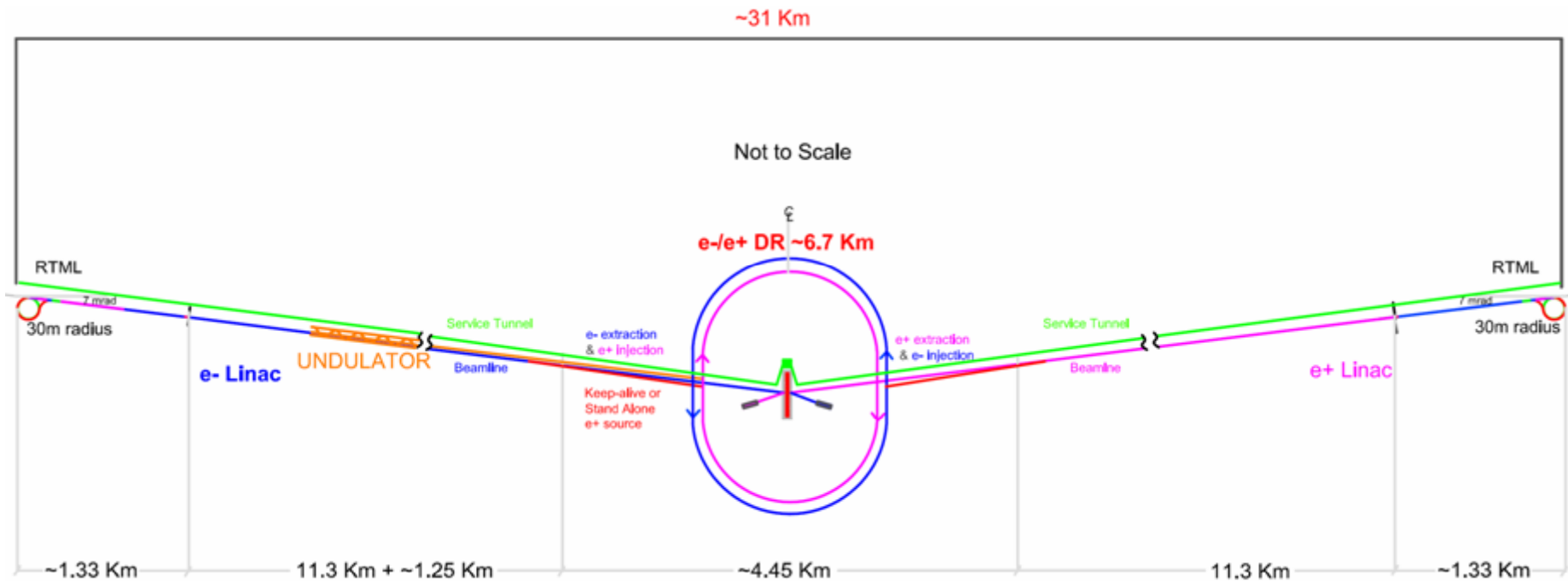
EuroTeV Meeting  
Uppsala 26/08/08





# Overall ILC Layout from RDR

1<sup>st</sup> Stage: 500 GeV; central DR et al. campus; 2 “push-pull” detectors in 14 mrad IR.



Schematic Layout of the 500 GeV Machine



## Post “Black December”

- Recovery plan now complete. No falling away of support or “Domino effect.”
- New R&D plan with two phases, one ending in 2010, the second in 2012 in place. Resources and timescales for the R&D announced in document in June.

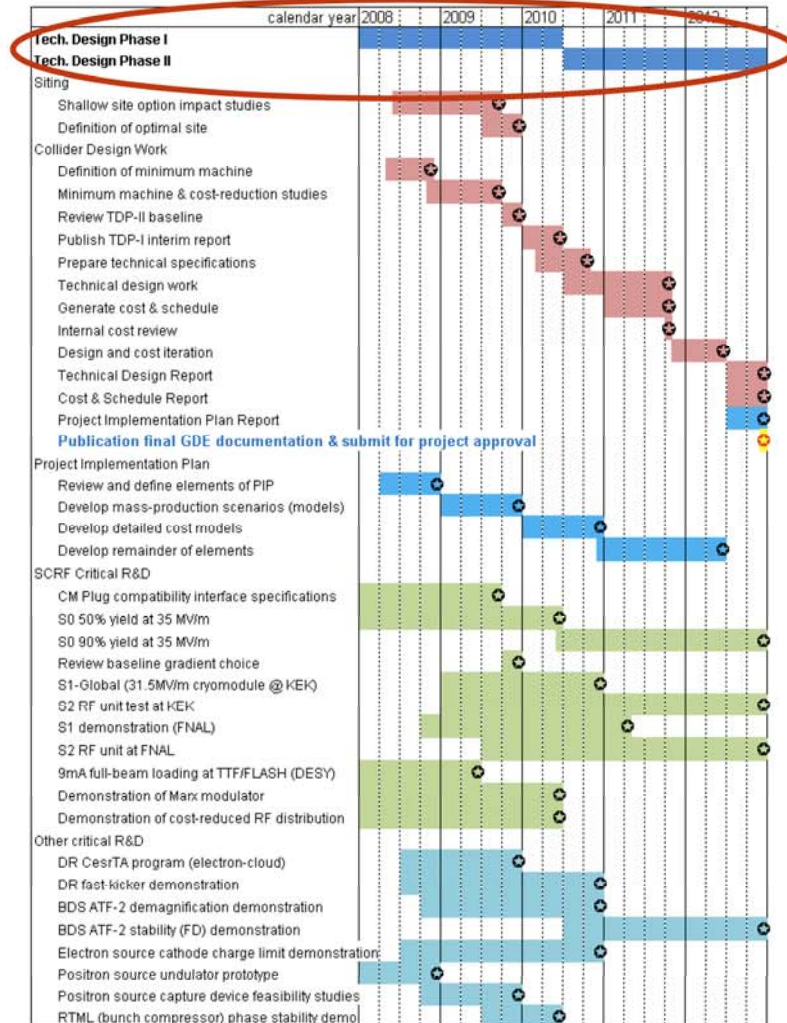


## GDE plan - the Technical Phase

- The period until April has been one of turmoil and substantial rethinking.
- ALL of the major areas developed by the RDR had US or UK scientists in the leadership positions.
- It can't be business as usual when such a large fraction of resources lost – 40 FTEs in UK – round £4M/year from UK - \$60M -> \$15M in US.
- New plan for TP phase concentrates and reduces work and lengthens timescales.



# Technical Design Phase Planning



- Basic time-scale

- Phase 1: July 2010

- Paris meeting already scheduled

- Phase 2: end of CY 2012

- Not previously well-defined
    - Fits with current SCRF planning (S2 for example)

- Encapsulates the PMs strategy and vision for the next four years

- Critical R&D

- Cost reduction / machine design

- Project Implementation Plan

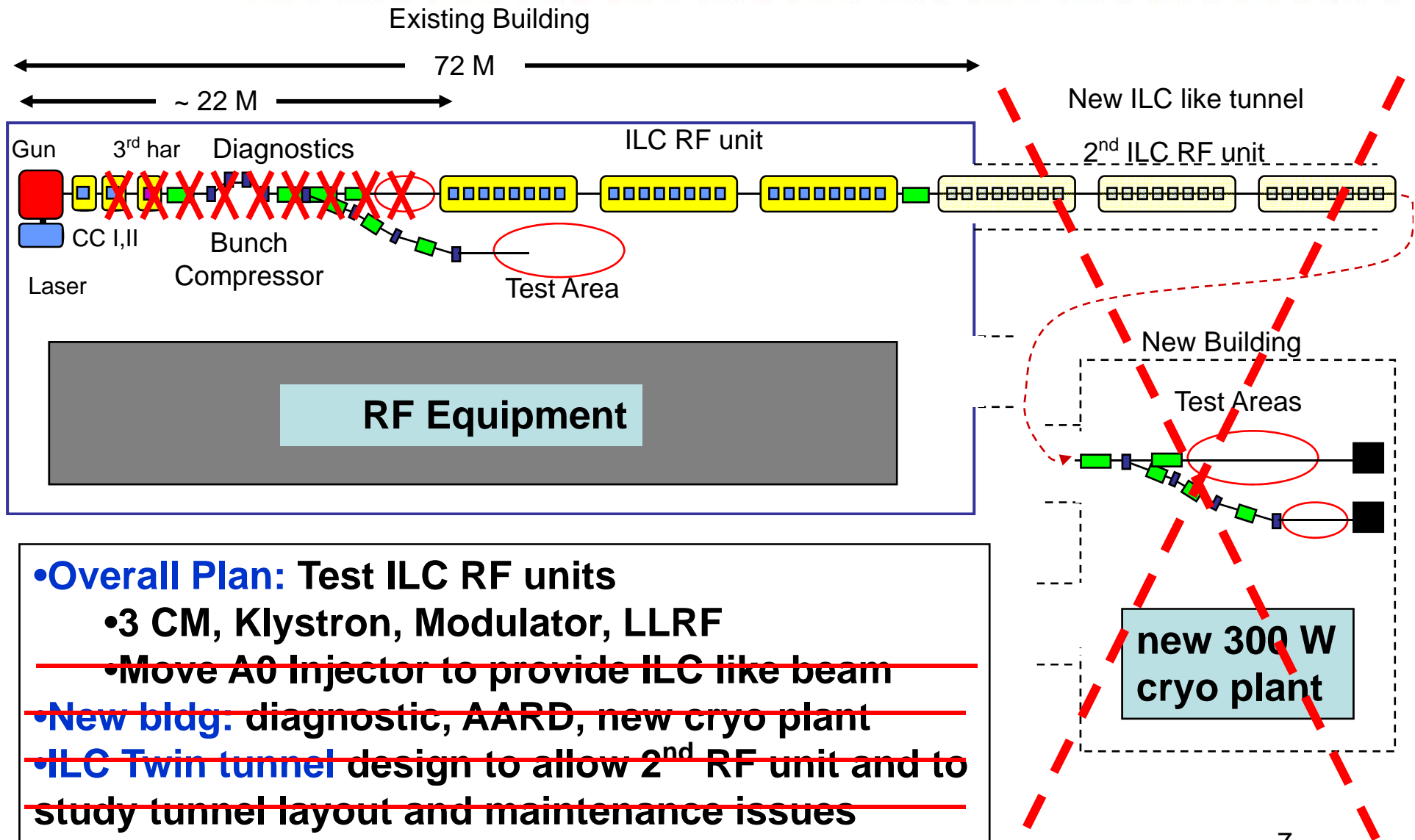


# TDP R&D - SCRF

Calender Year		2008	2009	2010	2011	2012
EDR	TDP1			TDP-II		
<b>S0:</b> Cavity Gradient (MV/m)	30	35 ( > 50%)			35 ( > 90%)	
KEK-STF-0.5a: 1 Tesla-like/LL						
KEK-STF1: 4 cavities						
<b>S1-Global</b> (AS-US-EU) 1 CM (4+2+2 cavities)		CM (4 <sub>AS</sub> +2 <sub>US</sub> +2 <sub>EU</sub> ) <31.5 MV/m>				
<b>S1(2)</b> -ILC-NML-Fermilab CM1- 4 with beam			CM2	CM3	CM4	
<b>S2:STF2/KEK:</b> 1 RF-unit with beam			Fabrication in industries		STF2 (3 CMs) Assemble & test	



# TDP R&D - SCRF







## GDE plans – Cost reduction

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- Particular concentration in early phase of TP is on cost reduction. Task forces at Sendai met for two days looking at very many ideas – some crazy, some obvious – as to how to reduce the cost of the RDR machine significantly.
- Will continue to be a priority at future meetings. Concept of “minimum machine” being developed.





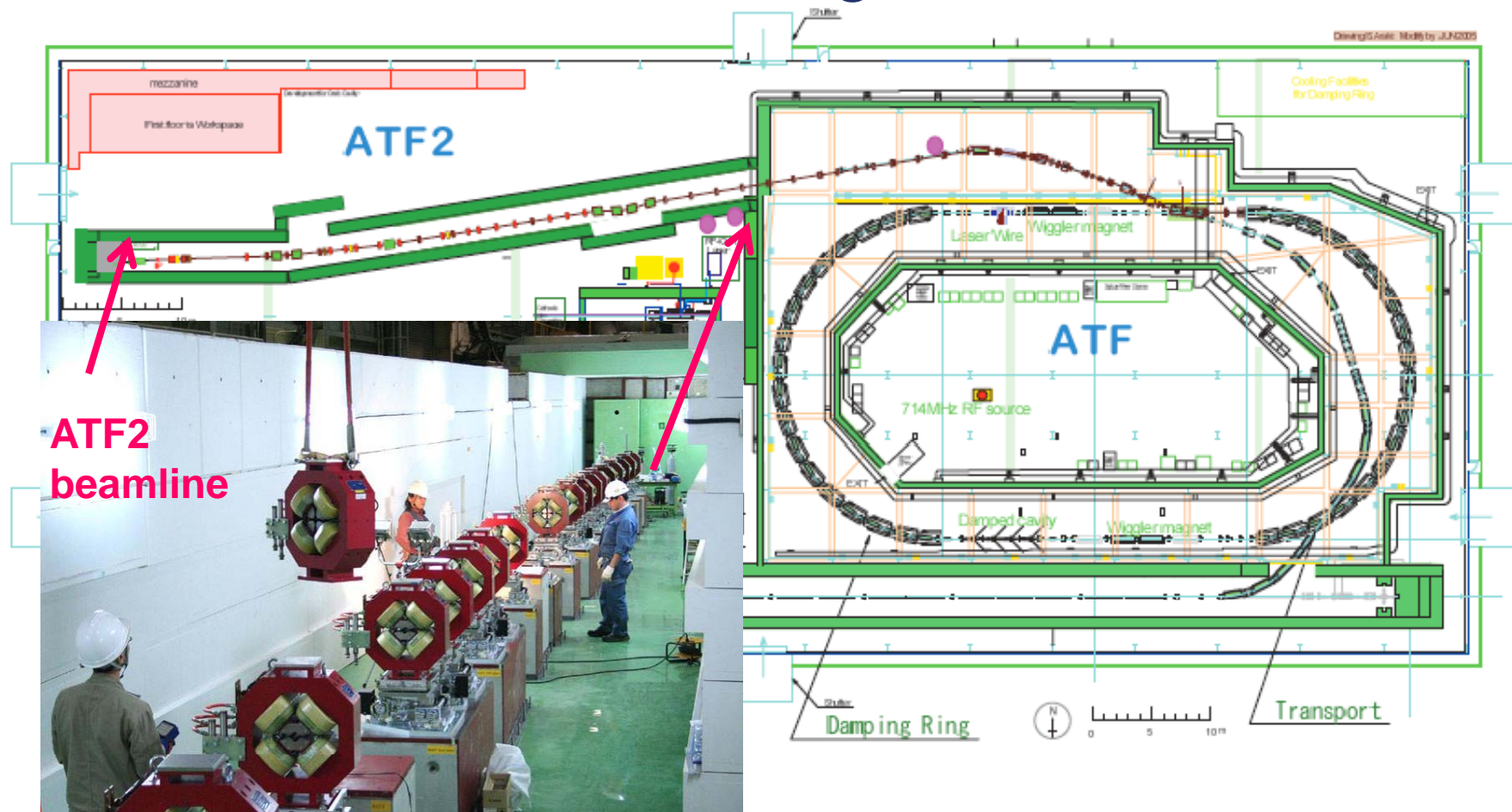
## TDP R&D – BDS/MDI

- Perhaps group most strongly affected by “Black December” – dominated by UK/US.
- A great deal will have to be put on hold – but work is continuing on highest priority issues.
- Remember that ATF2 due to come on line in Oct! Will be of major importance for BDS studies and much more!



# TDP R&D – BDS/MDI

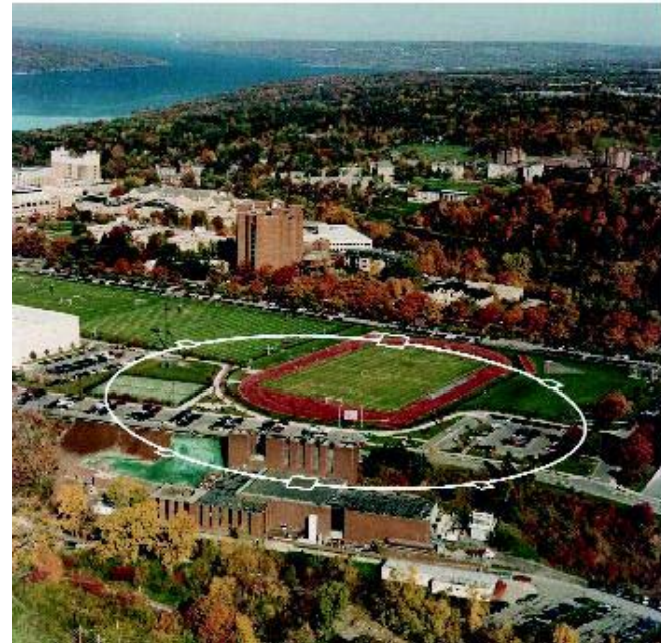
- ATF collaboration > 200 scientists, 20 institutions. ATF2 designed for ILC.





## TDP R&D – DR

- One of areas where significant critical R&D remains to be done – if particular in properties and defences against electron-cloud effect.
- CESR-TA project (funding ~agreed from NSF with some matching DoE funds.
- July 7-11 Cornell  
– **Damping Ring Workshop**





# ILC R&D Plan

- Now available!



- First Official Release
- Released in Dubna
- Next review and release:  
December 08



## ILC-CLIC synergy

- Cooperation ongoing before “Black December”.
  - Co-conveners - CLIC-ILC working groups
    - **Civil Engineering and Conventional Facilities (CFS):** Claude Hauviller/CERN, John Osborne/CERN, Vic Kuchler (FNAL)
    - **Beam Delivery Systems and Machine Detector Interface:** D.Schulte/CERN, Brett Parker (BNL), Andrei Seryi (SLAC), Emmanuel Tsesmelis/CERN
    - **Detectors:** L.Linssen/CERN, Francois Richard/LAL, Dieter.Schlatter/CERN, Sakue Yamada/KEK
    - **Cost & Schedule:** John Carwardine (ANL), Katy Foraz/CERN, Peter Garbincius (FNAL), Tetsuo Shidara (KEK), Sylvain Weisz/CERN
    - **Beam Dynamics:** A.Latina/FNAL), Kiyoshi Kubo (KEK), D.Schulte/CERN, Nick Walker (DESY)





## ILC-CLIC synergy

- Regular phone meetings of convenors.
- Context of collaboration is to concentrate on those areas from which both ILC & CLIC will benefit.
- Will be meetings during CLIC collaboration meeting in CERN in October.



## Dubna GDE meeting, 06/08

- The GDE met in Dubna in June for a meeting that was advertised as concentrating on Conventional Facilities & Siting. More than 70 attended.
- Substantial discussion of advantages of shallow site – the Dubna proposal still uses a tunnel-boring machine rather than cut&cover but benefits from isolated & unpopulated nature of the site.

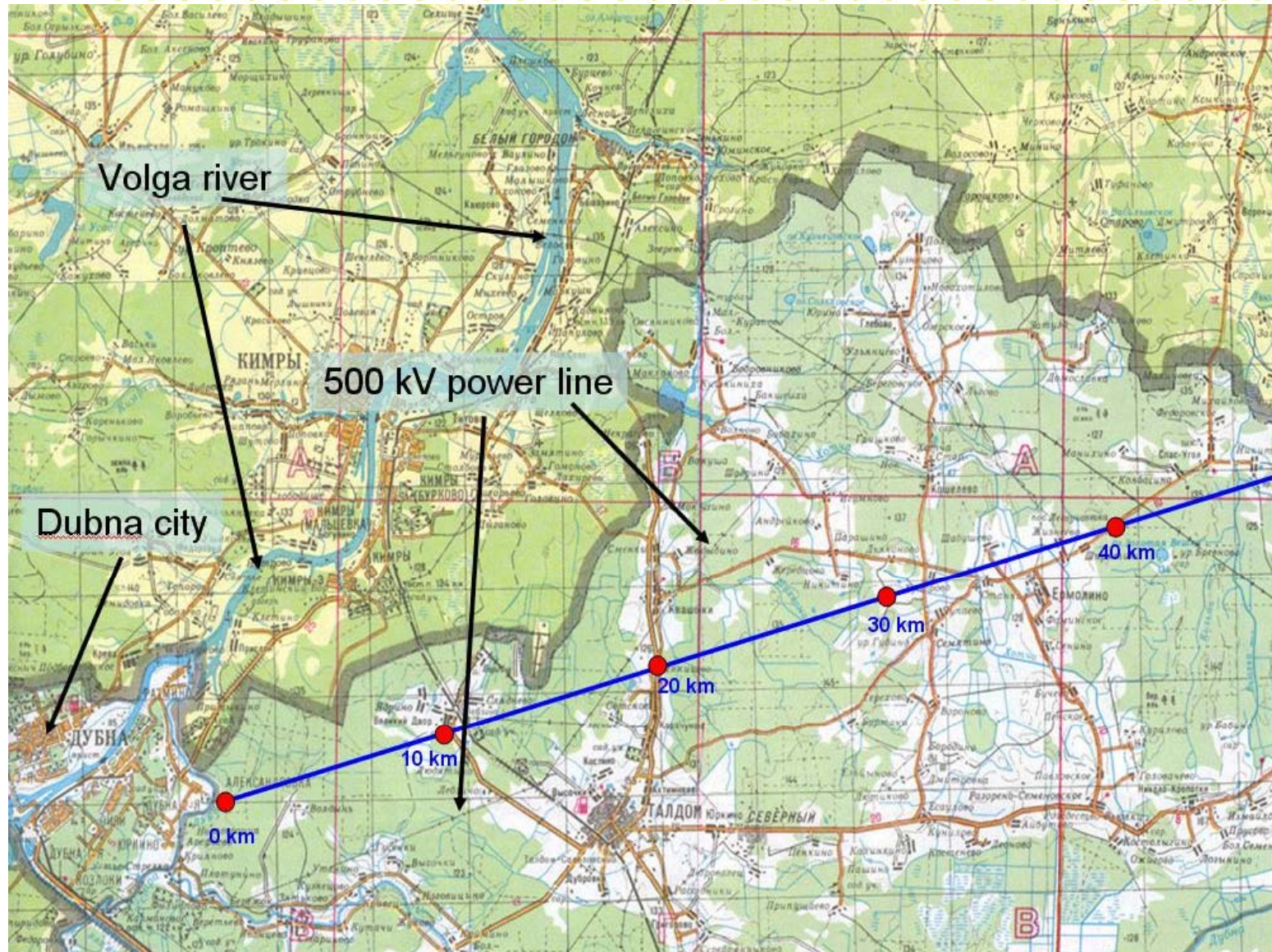








# Dubna GDE meeting, 06/08







## Dubna GDE meeting, 06/08

- Prem meetings with the GSPI engineers before the meeting to discuss exploratory engineering study.





## Dubna GDE meeting, 06/08

- Agreement on ~ \$100K engineering study to be conducted by GSPI, partly funded through EU HiGrade project – which was officially announced last week and started in February. Hope is that Dubna and other Russian institutes will become EU associates in the project.
- GSPI calculate that moving the service tunnel to surface will save ~ 10% of TOTAL civil construction cost.





## WWS Meeting Warsaw, 06/08

- Research Director and his structures now becoming very active:

- **The purpose of the LOI:**

Submitted LOIs will be validated by IDAG to be implemented in the GDE's technical design.

- **The due date of LOI:** end March, 2009

- **A new time line:** to keep synchronized with that of GDE.

Phase I till 2010 → an interim report (?)

Phase II till 2012 → ILC proposal of GDE with detectors

- **Call for EOI** (Due date End of March 2008)

- **Managing structure:**

RD + Regional contacts,

LOI groups, Common task groups



# WWS Meeting Warsaw, 06/08

IDAG was formed

In total 16 members

10 Experimentalists

3 Accelerator physicists

3 Theorists

Most of the experimentalist  
are from out of ILC community.

All the accelerator members  
and theorists are ILC experts

- Prof. Michael Danilov (ITEP)
- Prof. Michel Davier (LAL) (Chair)
- Prof. Abdelhak Djouadi (Paris Sud)
- Dr. Eckhard Elsen (DESY)
- Prof. Paul Grannis (SUNY)
- Prof. Rohini Godbole (IIS)
- Dr. Dan Green (FNAL)
- Prof. JoAnne Hewett (SLAC)
- Prof. Thomas Himel (SLAC)
- Prof. Dean Karlen (Victoria)
- Prof. Sun-Kee Kim (Seoul)
- Prof. Tomio Kobayashi (Tokyo)
- Dr. Weiguo Li (IHEP)
- Prof. Richard Nickerson (Oxford)
- Dr. Sandro Palestini (CERN)
- Prof. Nobukazu Toge (KEK)





## ILCSC Meeting Dubna, 06/08

- ILCSC also met during Dubna meeting. It heard reports from GDE & Research Directors. It congratulated GDE on excellent recovery plans. Most of discussion was on plans for detectors and Lols etc.
- ILCSC will set up subcommittee to suggest siting policy & mechanisms. Members will be A. Wagner, P. Oddone, A. Suzuki.



## ILCSC Meeting Dubna, 06/08

- This subcommittee will also interact with GDE committee on governance, chaired by BF – other members are B. Barish, M. Harrison, E. Paterson, S. Yamada.
- The HiGrade project will also set up similar committee with European perspective which will interact with both of these, also chaired by BF. Membership of this is still being finalised.



## FALC Meetings 1/08

- FALC met 17/18.1.2008 & confirmed that the physics motivation for a linear collider remains unchanged.
- The R&D underway in all three regions is fulfilling an important mission to establish the feasibility and technology necessary for the next large collider.
- FALC recognized that funding stability is the key to any international collaborative effort so none of the partners' investment is jeopardized.



## FALC Meetings 7/08

- FALC met 14.7.2008 in Rome.
- New R&D plan presented and endorsed.  
FALC statement:
- "The availability of first results from the LHC are expected to show if the ILC is the correct route for a future linear collider or whether a higher energy reach, as could be obtained with CLIC, is required. The need to reach international agreements on siting and construction, and the current availability of R&D funds all suggest the potential of a construction decision for the ILC near the middle of the next decade."
- P. Coulombe (Canada) elected as next chair.



# ILC in US

- US Program

- **Before:**

- ILC R&D planned for President and Congressionally approved budget of \$60M.
    - Broad R&D program, develop US siting and industrialization

- **Now:**

- Budget reduced to \$15M for FY08,
    - Almost all was already spent by Jan 08.
    - US DoE supported ILC R&D suspended for remainder of FY08

- **Future Plan:**

- Reduced level R&D for FY09 and beyond.
    - US President's FY09 budget proposal is \$35M
    - pre-CD0 program until LHC results justify
    - Result - Focussed US R&D program
    - Impact of likely Continuing Resolution in FY09 is unclear



## ILC in US

- Recent supplementary budget very good news for particle physics in US. DoE received \$62.5M, of which \$32M was for pp. Most of this went to Fermilab, with \$2M to SLAC. This will stop layoffs at Fermilab and some was earmarked for NoVA.
- Although no direct help for ILC, there will be indirect feedthrough at Fermilab. Important psychological boost for US pp.



## ILC in UK

- Confusing! Initial intemperate statements from STFC CE have faded away. Very critical report from Parliamentary watchdog on events surrounded ILC and of CE personally. Government response to that report contains following about ILC:  
“Although, (*sic*) it is true STFC has chosen not to ramp-up investment in the current International Linear Collider project, STFC will continue to participate in developing global strategies for future Linear Colliders and continues to honour its commitments to the common development fund.”





## ILC in UK

- Nevertheless, there has, and will be, very significant pain caused by the fact that ILC investment has been cut by factor 4. These cuts now being implemented are will probably be complete by Xmas. I have been working with J. Womersely to rescue whatever possible from LCABD wreckage. Agreement reached on ongoing (3-year) programme at around £1M/year. Safeguards leading management roles in GDE + engineering and small R&D and travel/cons.



## ILC in UK

- Not so easy for detector collabs. – LCFI and CALICE. Hope to be able to continue “generic” aspects. Discussions with various organs at STFC continue.
- We have agreed that UK institutions will sign Eols, Lols, whatever....
- I signed the ILCSC MoU for ILC activities inside GDE as Spokesperson for the LCUK Collaboration.



## ILC in EU

- HiGrade is “Preparatory Phase” project intended for projects on the ESFRI Road Map.
- EU starting documents received – eventually after long hold-up related to financial status of DESY– start backdated to Feb 1<sup>st</sup>. Site selection, governance & outreach is ~ 50% of effort; remainder in SCRF and cavity production on back of XFEL.
- “Kick-off” meeting at DESY on August 29<sup>th</sup>, directly after this meeting. Hope to have first meeting of various working groups.



## ILC in EU

- EUCARD contains very substantial admixture of ILC work, in close coordination with CLIC, which has very substantial synergies. Reduction of scope from 15 Meuro EU request to 10 Meuro awarded currently ongoing. Largest cuts recommended by reviewers in SC part. Typical reduction in EU contribution to parts of project with strong LC interest ~ 25%.



## ILC in Asia

- Substantial funding (> 1M Euro) for Chinese effort in superconducting cavities from IHEP announced this month.
- Continuing steady process of involving Japanese politicians in ILC. High-level visit to DESY and then CERN by Masamitsu Naito, very influential member of LDP in Diet. He was very positive and asked many penetrating questions. He is confused as to who his contacts should be in Europe at political level.



## Summary and Outlook

- Last 8 months have been pretty traumatic. Significant loss in resource has meant substantial revision of R&D plans & extension of timetable.
- Recovery plans are now complete, although still significant uncertainty in some funding, particularly US. New studies on shallow site, cost reduction including progress towards “minimum machine” all making good progress.
- Next major meeting November 16-20 Chicago – LCWS /GDE Workshop joint with exp. & machine.