

Report on DESY

Overview and Highlights

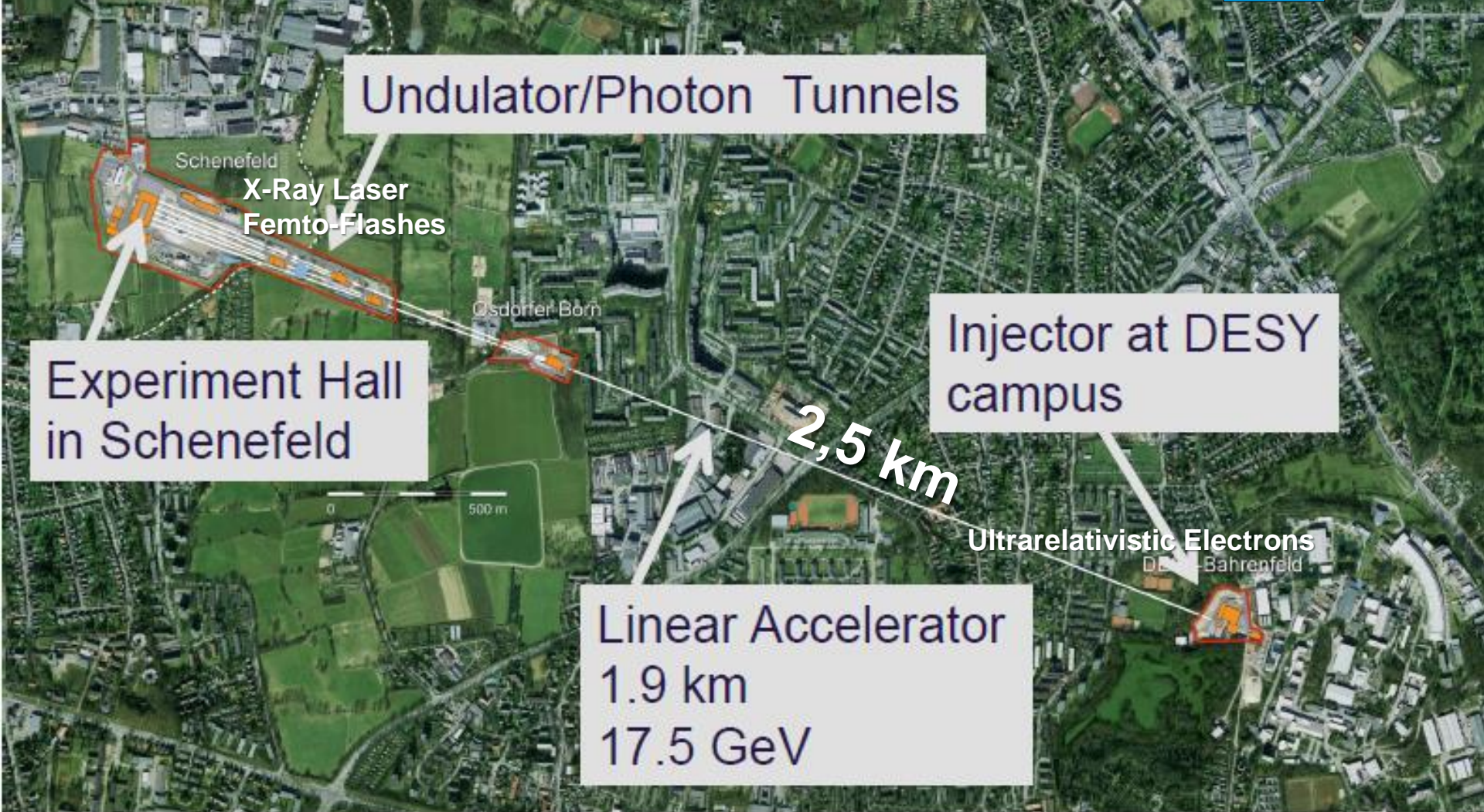
European XFEL
DESY Testbeam
LHC phase II in Germany
Strategy discussions in Germany

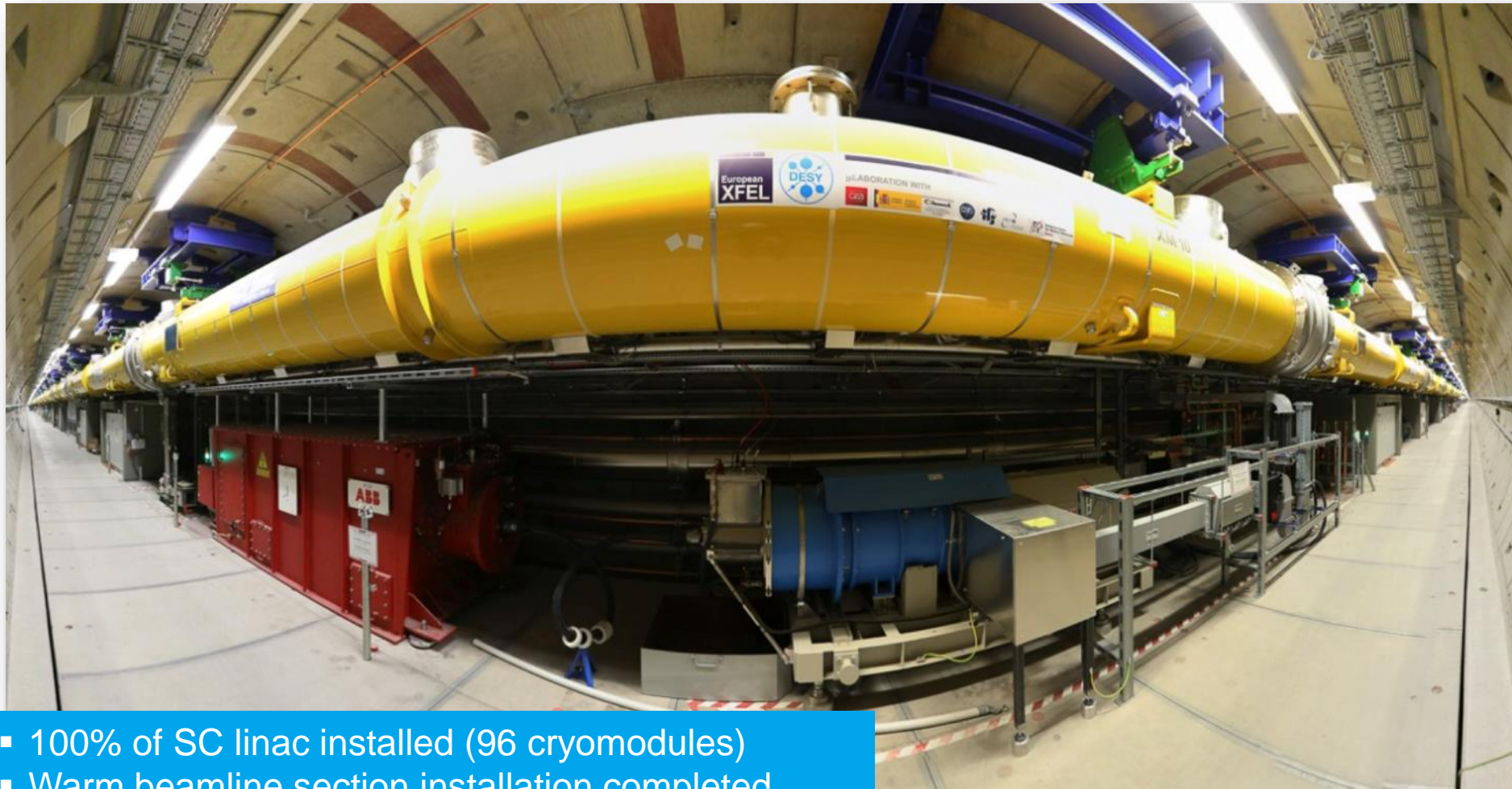
Joachim Mnich

Plenary ECFA Meeting
CERN, November 2016



EUROPEAN XFEL

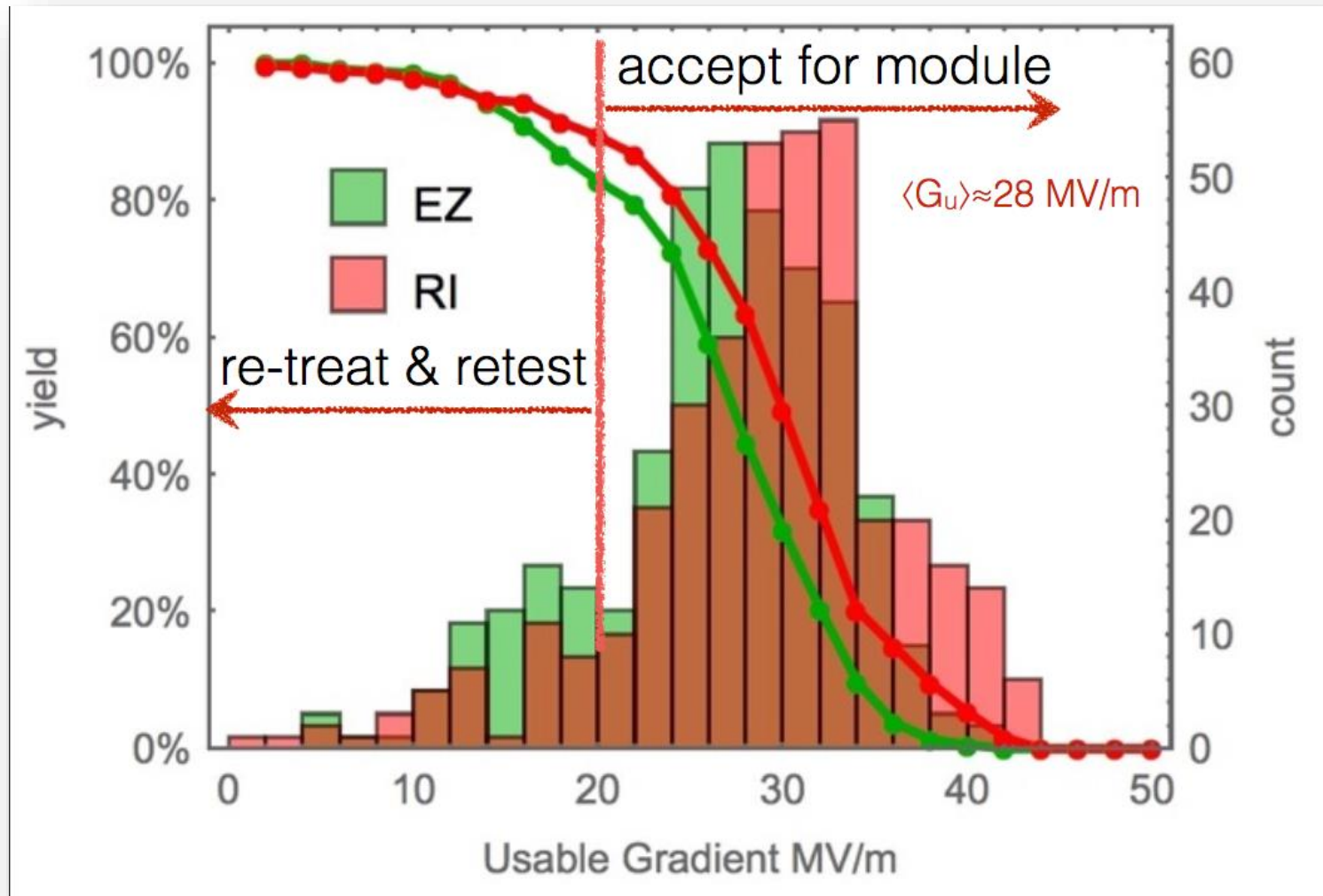




- 100% of SC linac installed (96 cryomodules)
- Warm beamline section installation completed
- Injector commissioning completed 7/2016

CAVITY PERFORMANCE AFTER RE-TREATMENT

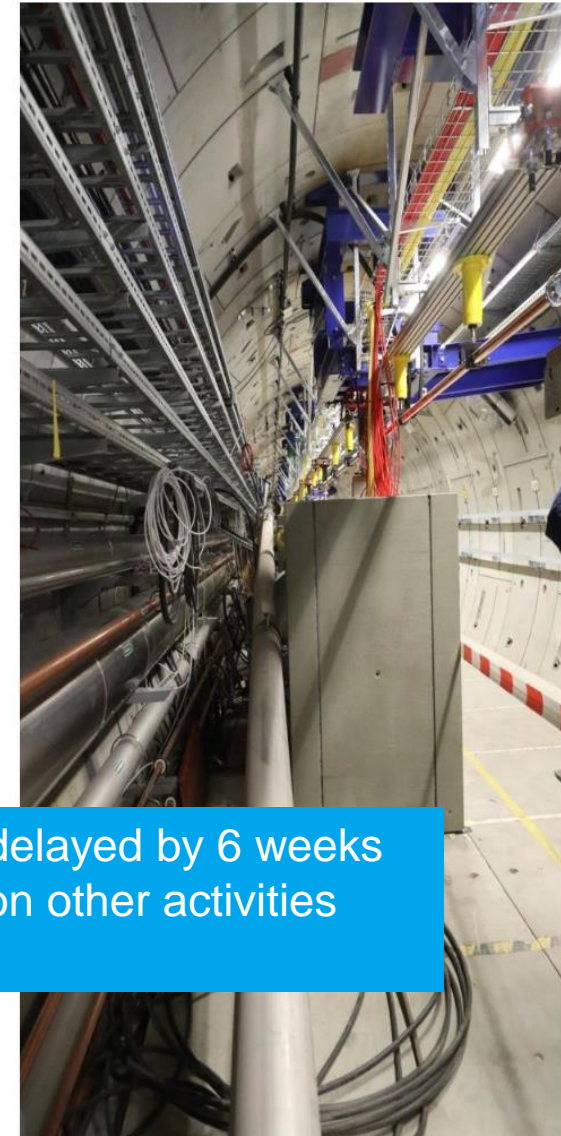
- > Very close to ILC specs, on an industrial scale!



Seemed to be ready to start linac cooldown in October...

- > ... until the pressure test (~20 bar) of the Helium exhaust line on Oct 11...
- > He pipe was tested 2 years ago, apparently without problems (but probably with bellows in a different state)
- > Design, construction and installation performed by professional company experienced in such systems (and well known & reputed at DESY)
- > Fix point at the end of the line (~50m from last module) could not stand the ~10 tons longitudinal force and broke loose
- > Pipe elongated by 1.5m and tore down suspensions over length of ~250m, connections to 2 cryo boxes were destroyed
- > Much of the pipe landed on wave, (fortunately) stayed in place
- > **No damage to insulation or beam vacuum of the modules!!**

- Cooldown schedule delayed by 6 weeks
- No significant effect on other activities (e.g. DAF etc.)



XFEL – UNDULATORS



XFEL – MOVED TO SCHENEFELD IN JUNE 2016

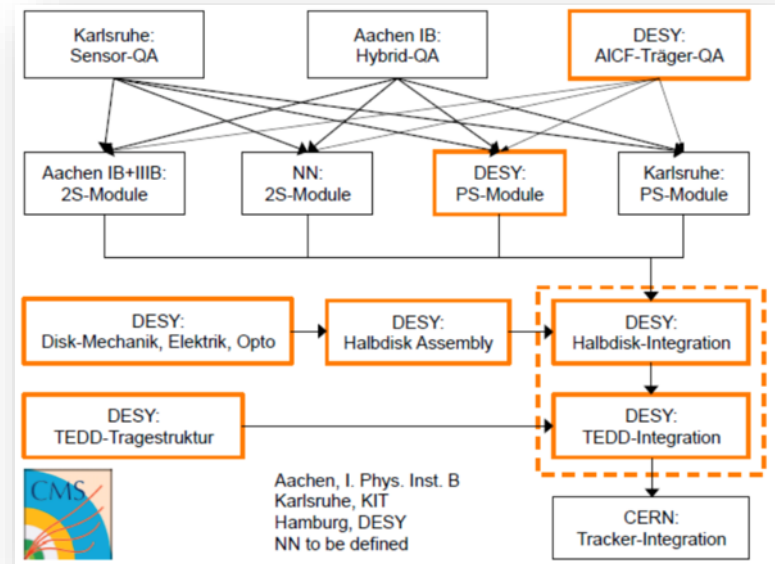
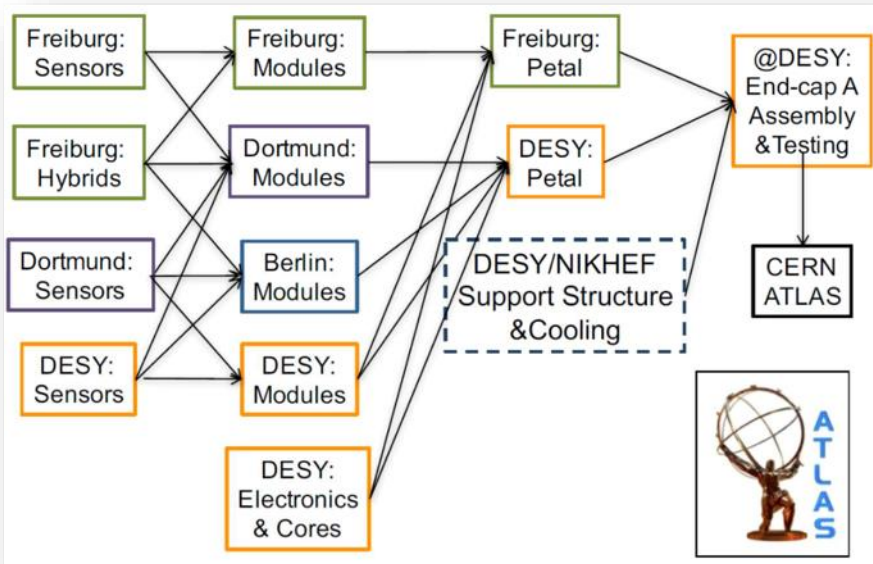


Headquarter - XHQ

LHC PHASE 2 UPGRADES (HL-LHC) IN GERMANY

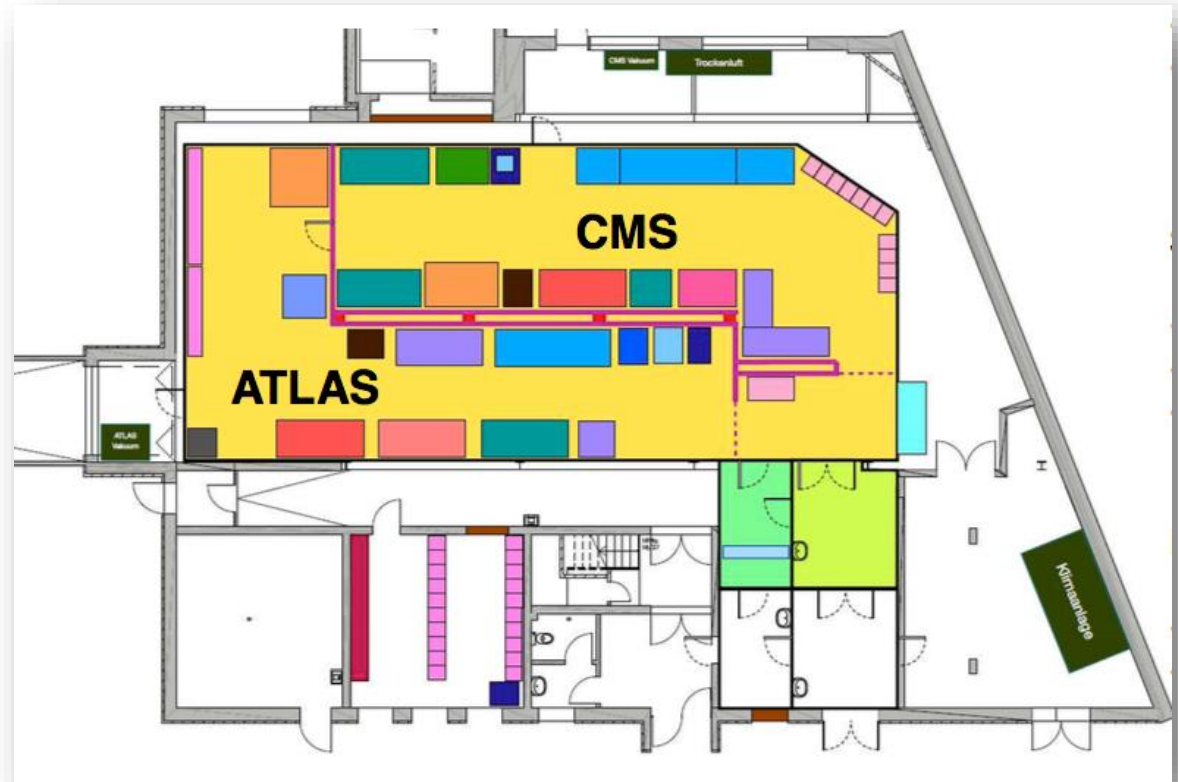
Major contributions from universities and DESY in both experiments:

- > ATLAS: Strip & pixel Si detectors, calorimetry, muon system, trigger&DAQ
- > CMS: Outer tracker, pixel detector, muon spectrometer
- > 90 M€ funds for universities from German ministry (BMBF)
- > Helmholtz contribution: 15.7 M€ strategic investment funds for tracker end-caps @ DESY (wrt. 20 M€ requested)
- > Strong cooperation between universities and DESY
 - Assembly and system tests of tracker end-caps for CMS and ATLAS @ DESY



BUILDING 25c – GROUND FLOOR

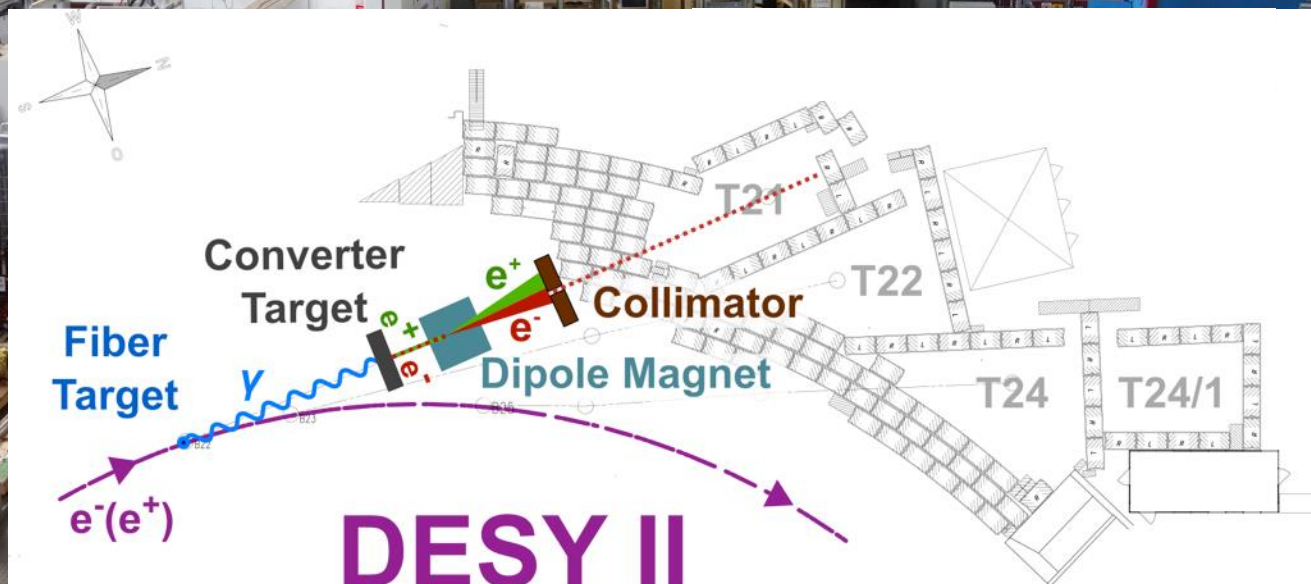
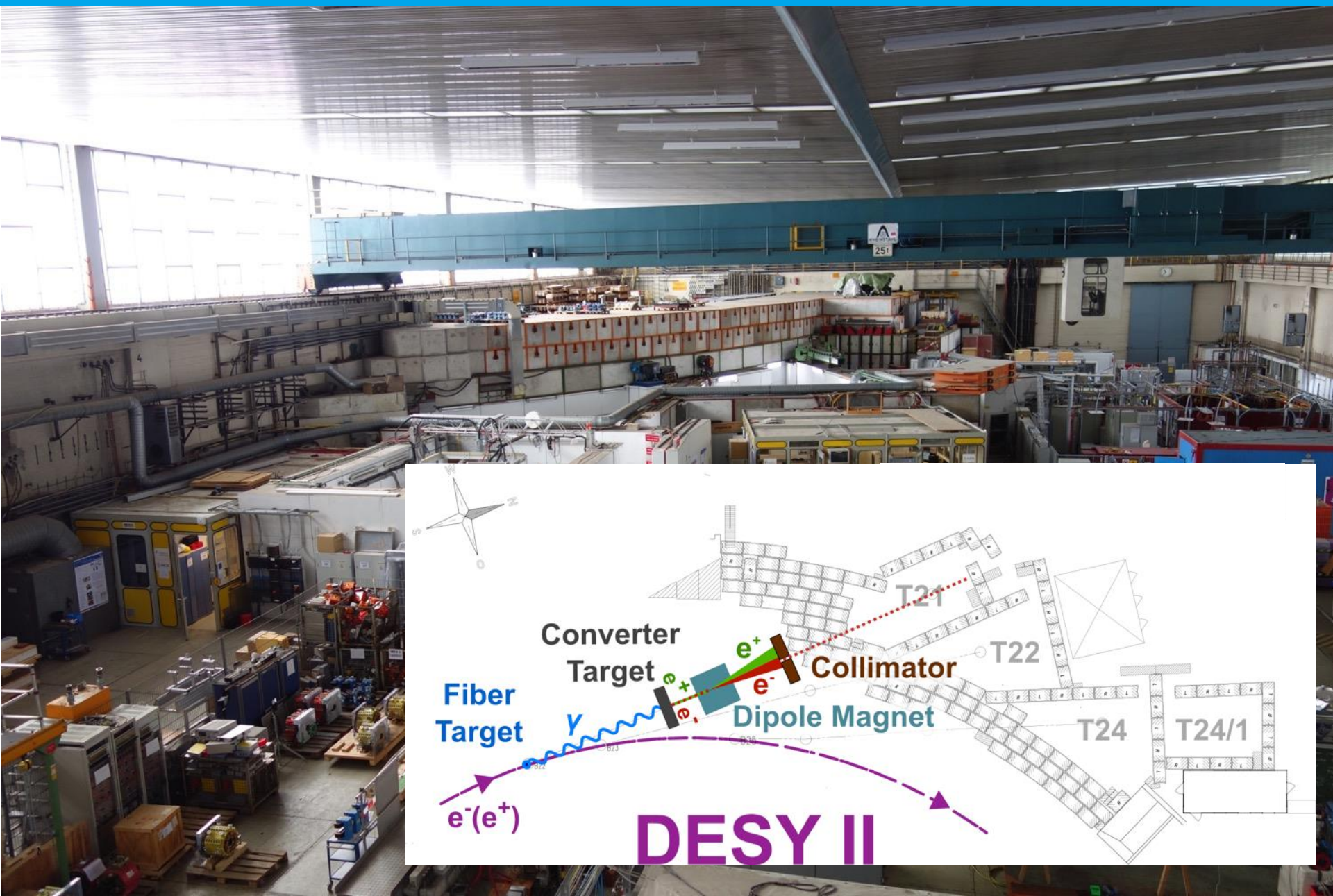
- > Module production and testing
- > Clean room ISO6
 - ~255 m²
 - Storage
 - Technical equipment
- > Status:
 - Old infrastructure / walls removed
 - Preparing for clean room installation
 - Tender for clean room in progress
- > Plan:
 - Clean room installation at the beginning of 2017
 - Ready for users mid-2017



BUILDING 25c: 15 NOVEMBER



DESY-II TEST BEAM FACILITY



TEST BEAM FACILITY

> Unique infrastructures at DESY

- Two pixel beam telescopes
 - High demand – requested by >70% of users
- PCMAG
 - 1 T superconducting solenoid with 1 m diameter
 - unique infrastructure worldwide

> Shutdown 2015-2016

- Complete overhaul of beam diagnostics in DESY-II Tunnel
- New Gas Safety System
- Laser Alignment System in each area
- New cabling & fiber links



> Further upgrades of the facility are being discussed

DESY-II TEST BEAM FACILITY

> Run 2016

- March 14th -December 23rd
- **Availability of synchrotron ~99%!**

> Requests 2016

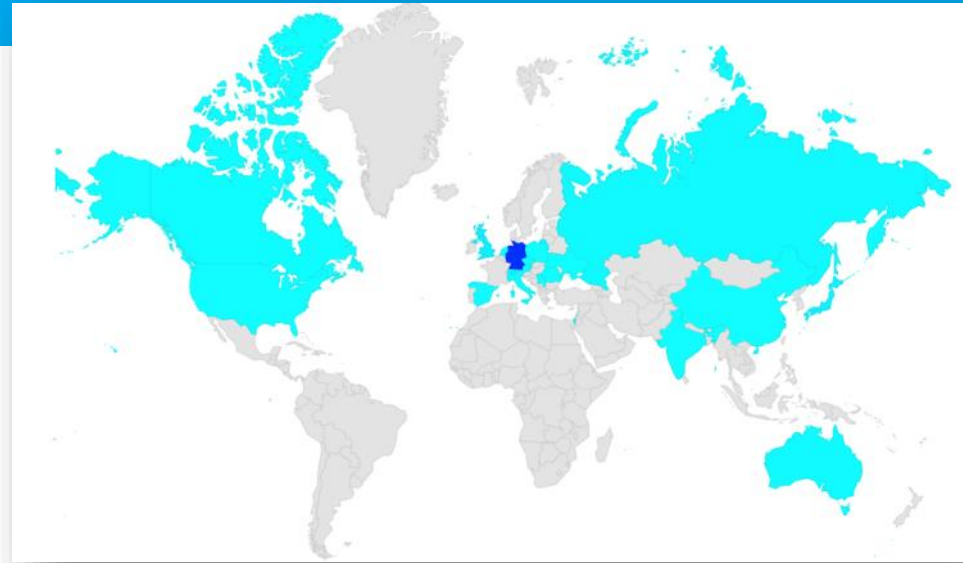
- ~ ½ from LHC groups
- 70% of groups request telescopes
- 243 users from 20 countries
- 62 % booked, 38% new users, 47 % students

> Highlights

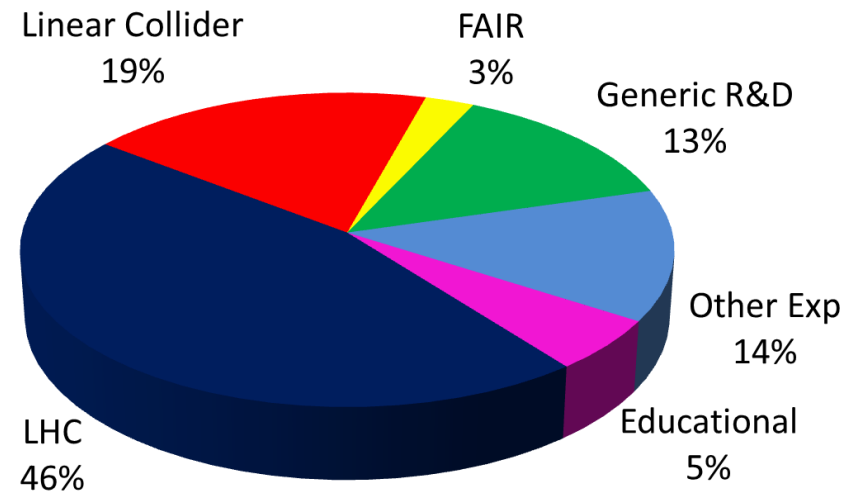
- Belle II tracking system test with 66 users
- **First time: physics teachers from Hamburg to perform experiments**

> Perspective:

- 2017 call out; so far 30 weeks requested

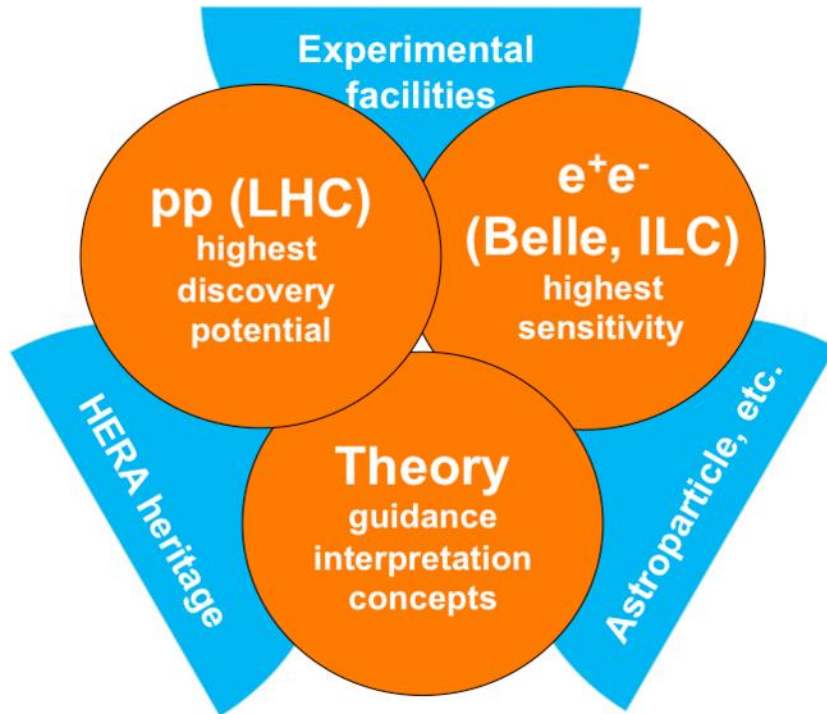


2016: 243 Users from 20 countries

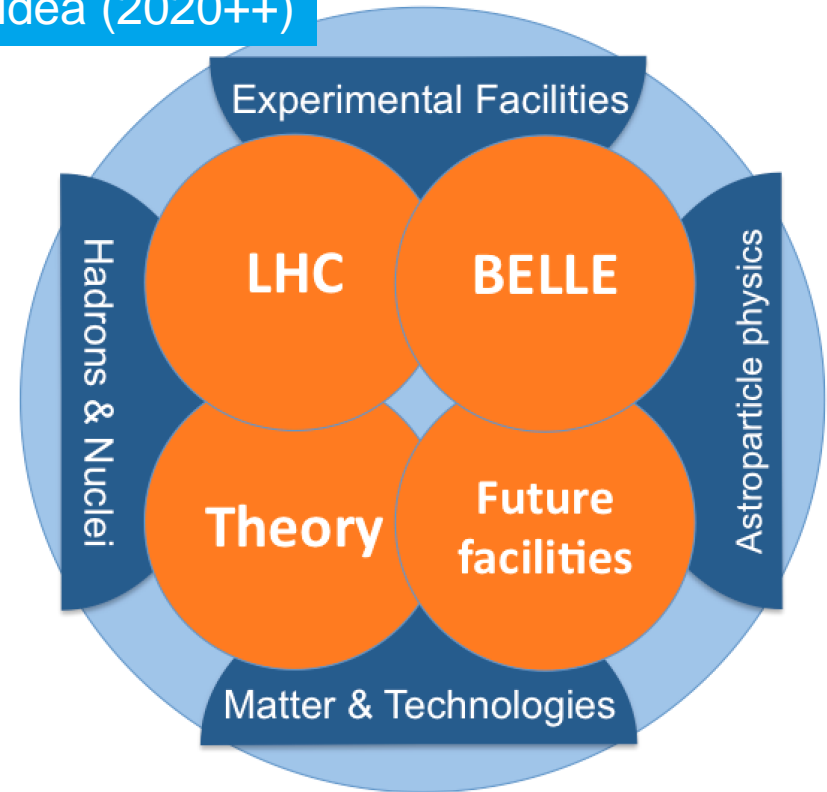


DESY: FROM POF 3 TO POF 4

POF 3 (2015-19)



POF 4 idea (2020++)



- > LHC (+ Belle + Theory) will remain the backbone of DESY particle physics in next funding period.
 - Explore potential in neutrinos (LBNF, CERN platform), axions (IAXO) and collider-based experiments (ILC, CLIC, FCC, CEPC, ...)

German Strategy Developments

Series of workshops organised by KET (+KAT+KHuK):

- > May 2016: future e^+e^- machines (Munich)
- > February 2017: neutrino physics (Heidelb.)
- > April 2017: non-collider expts. (tbd)
- > ..

The Future of Neutrino Physics

A German Perspective on Topics, Opportunities and Challenges

23-24 February 2017, MPIK Heidelberg



$e^+ e^-$ Colliders:
The Next Generation

KET workshop series on Germany's
strategy for the future of particle physics

May 2 & 3, 2016 Max-Planck-Institut für Physik, München

Program Organising Committee

- S. Bethke (MPP)
- K. Desch (U Bonn)
- E. Efsen (CERN)
- E. Garutti (U Hamburg)
- W. Hollik (MPP)
- J. Mnich (DESY)
- M. Schumacher (U Freiburg)
- G. Weiglein (DESY)

MPP Local Organising Committee

- S. Bethke
- W. Hollik
- S. Kluth
- H.G. Moser
- A. Schielke
- F. Simon
- S. Stonjek

KET
Network for
Experimental High Energy Physics

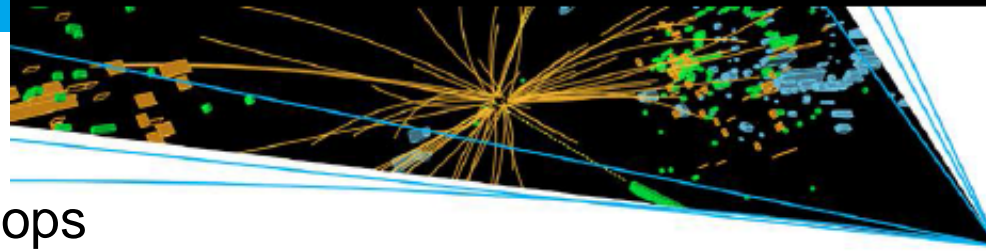
Max-Planck-Institut für Physik
www.mpp.mpg.de

www.mpp.mpg.de/KETeeWorkshop2016

- > Discussions results to serve as German input for European strategy



FUTURE ELECTRON-POSITRON COLLIDERS



- > Series of Workshops is being organised by German particle physics community
- > First on future e^+e^- colliders
- > Conclusions:

Conclusions of the

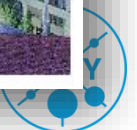
KET Workshop on Future e^+e^- Colliders^a

Max-Planck-Institut für Physik Munich, May 2-3, 2016

1. The physics case for a future e^+e^- collider, covering energies from M_z up to the TeV regime, is regarded to be very strong, justifying (and in fact requiring) the timely construction and operation of such a machine.ⁱ
2. The ILC meets all the requirements discussed at this workshop.ⁱⁱ It is currently the only project in a mature technical state. Therefore this project, as proposed by the international community and discussed to be hosted in Japan, should be realised with urgency. As the result of this workshop, this project receives our strongest support.ⁱⁱⁱ
3. FCC-ee, as a possible first stage of FCC-hh, and CEPC could well cover the low-energy part of the e^+e^- physics case, and would thus be complementary to the ILC.^{iv}
4. CLIC has the potential to reach significantly higher energies than the ILC. CLIC R&D should be continued until a decision on future CERN projects, based on further LHC results and in the context of the 2019/2020 European Strategy, will be made.

FCCWEEK 2017
Future Circular Collider Conference
BERLIN, GERMANY
29 MAY - 02 JUNE
fccw2017.web.cern.ch

Logos: European Union, CERN, IEEE CSC, DPG, DESY



Backup



DETECTOR ASSEMBLY FACILITY (DAF) AT DESY

- > 10 M€ investment into DESY infrastructure
- > Started 06/16
Building 25c:
 - Lab space and clean rooms
 - QA
 - Module production
 - Module testing
- > Starting 2017
Building 26 (hall 1):
 - Hall with cleanrooms
 - Petal & DEE assembly
 - End-cap integration
 - System test
- > Shared by ATLAS and CMS

