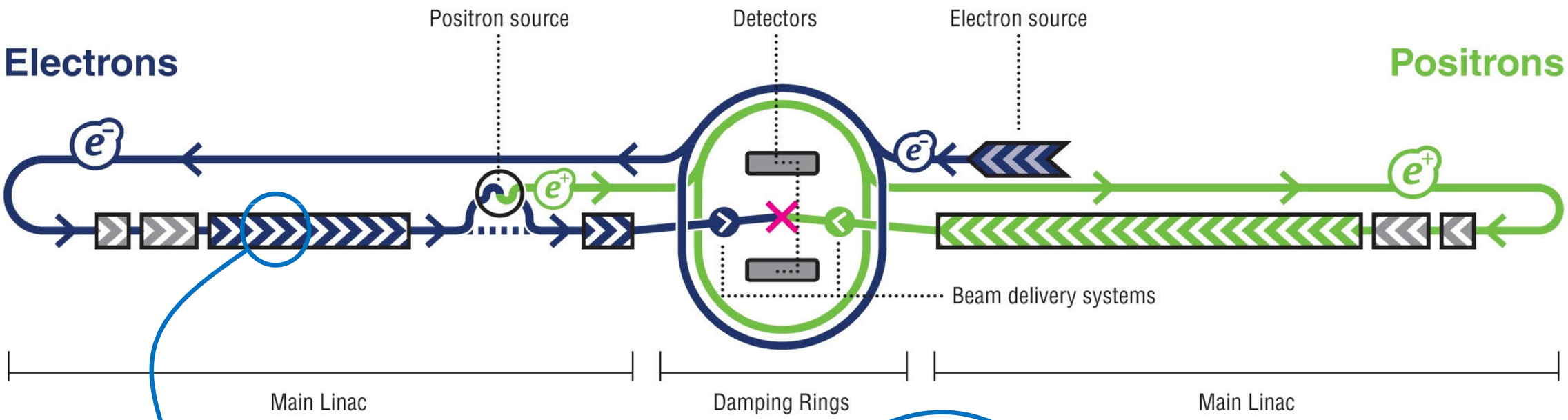
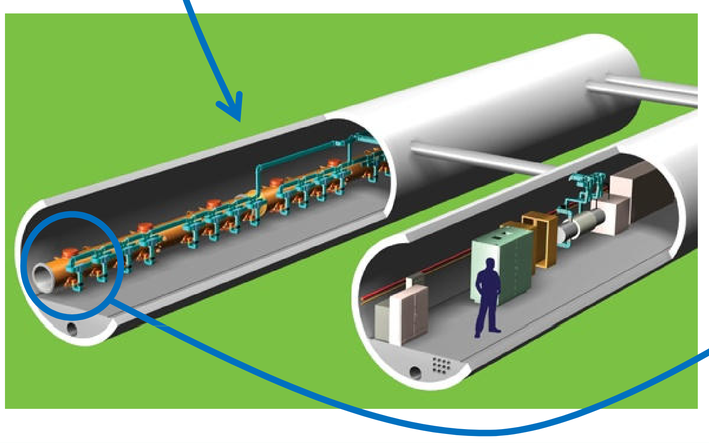
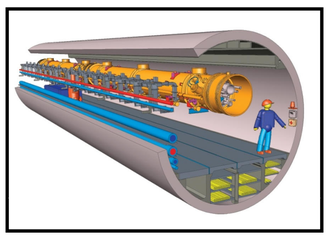
ILC @ DESY





The 1.3 GHz Superconducting RF Technology developed by the TESLA collaboration remains DESY's (and Europe's) primary contribution to the world-wide ILC development.

Via synergy with the European XFEL project, DESY – together with its European partners -- maintains its leadership role in this technology.



Two projects based on one common (TESLA) technology

DESY's (Europe's!) largest contribution to ILC (via XFEL synergy)

From the end of 2009 until the end 2012, XFEL will mass-produce, install and commission 101 SCRF cryomodules

- very similar to ILC cryomodules
- 808 cavities, HP couplers, tuners etc.

Nominal operational cavity gradient requirement lower for XFEL (23.5 MV/m) than for ILC (31.5 MV/m), but the high-gradient performance is still a goal of the DESY R&D

- Particularly achieving the high-gradients in routine mass-production (see ILC-HiGrade below)
- High-gradients give XFEL both safety margin and potential upgrade possibilities, as well as directly supporting ILC R&D.

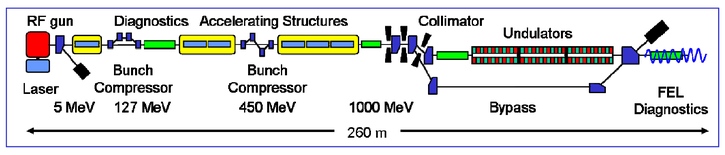
XFEL-ILC synergy also extends to governance and project implementation, as an example of an international "in-kind contribution" project

- linac technology supplied by a collaboration of China (IHEP), Germany (DESY), France (SACLAY, LAL), Italy (INFN), Spain (CIEMAT), Poland.

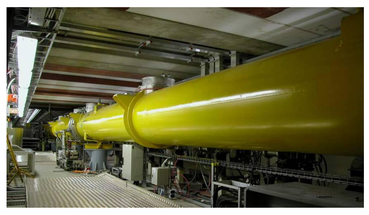
Important relevance for ILC Technical Design Phase:

- Implementation Plan for ILC
- Cost update!

TTF/FLASH
A Unique World-Wide Facility



The ~1 GeV linac of the SASE VUV laser provides a unique test facility for both the XFEL and ILC. Currently constructed from 6×8-cavity cryomodules, it acts as a integrated systems test for the SCRF linac technology.



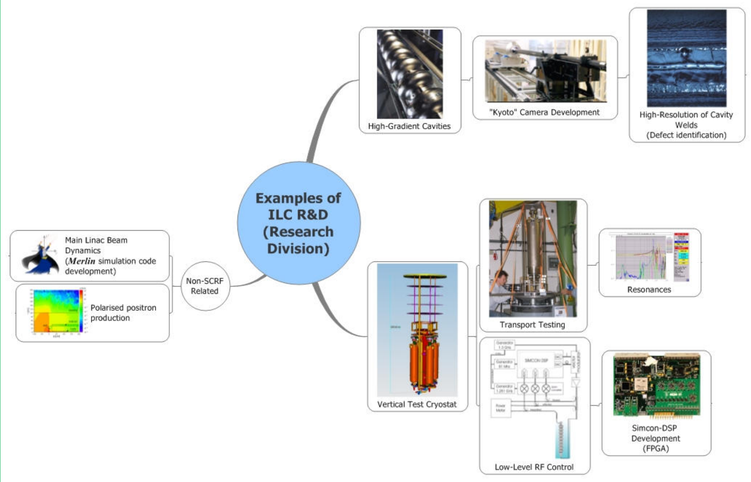
		XFEL	ILC	FLASH design	FLASH 9mA experiment
Bunch charge	nC	1	3.2	1	3
# bunches		3250*	2625	7200*	2400
Pulse length	µs	650	970	800	800
Current	mA	5	9	9	9

At present, an ILC-GDE driven international collaboration is preparing a demonstration of long-pulse full beam-loading in the TTF linac (so-called 9mA Experiment).

The parameters of the experiment will push the limits of the current machine, and gain invaluable operational experience.

The current phase of the experiment is scheduled for September 2009. Further experimental programmes will be developed as part of DESY's overall ILC R&D strategy.

SCRF R&D (Research Division)



R&D in the DESY Research Division is supporting ILC activities primarily by helping to develop systems for mass-production of the XFEL cavities.

A specific ILC goal is the quality control needed for ILC-like high-gradients (35 MV/m). As part of the world-wide ILC cavity programme, DESY is helping to further develop a novel inspection technology from KEK and Kyoto University, with a view to deployment in industry as part of the quality control during XFEL mass-production.

Further examples include the development of the vertical test stand, which will also be used for transportation to and from DESY. Automated controls are required for mass-production testing (at DESY); the Low-Level RF control for the test stand is similar to that used in the linac itself, and represents state-of-the-art development.

Beyond SCRF R&D, other activities include beam dynamics simulationd and design of the polarised positron source.

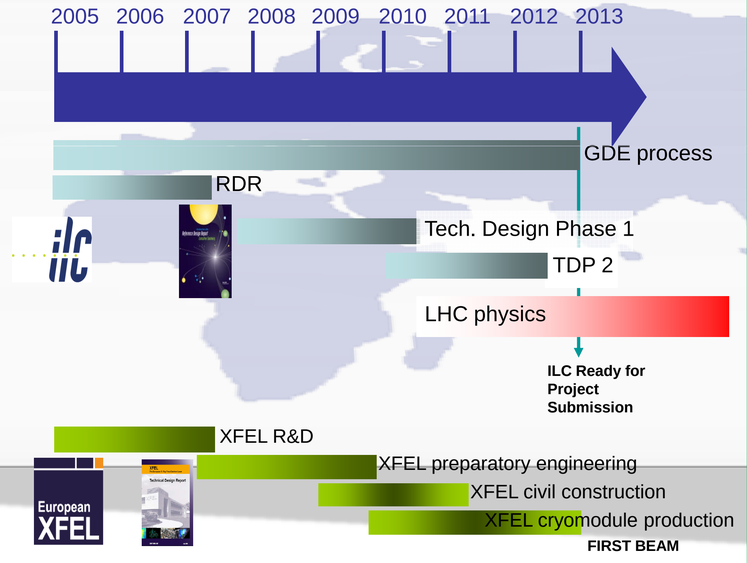
DESY and the ILC Global Design Effort (GDE)

As a world-wide leader in the development of the SCRF linac technology chosen for the ILC, DESY has played a strong leadership role in the GDE since its formation in 2004.

As the GDE continues in the ILC Technical Design Phase, DESY continues to maintain it strong management roles beyond the synergy with the European XFEL:

- Project Management for Accelerator Systems
- Assistant Project Manager for CFS and Global Systems
- Co-chair of the GDE Accelerator Advisory Panel
- Global support for EDMS systems and 3D-CAD integration
- European Communications & Outreach

DESY remains committed to the realisation of the ILC as a global project



ILC-HiGrade - Preparing for the ILC

As part of Framework Package 7, the European Commission has identified the ILC as a project suitable for *Preparatory Funding*. The resulting ILC-HiGrade programme is a collaboration between CEA Saclay, CERN, DESY, IN2P3 Orsay, INFN Milan and Oxford University. DESY is the coordinating institute.

Of the 8 ILC-HiGrade Work Packages, DESY plays the lead-partner in

- **Consortium management** (overall coordination)
- **Site Preparation** (development of site criteria; models for host selection; host responsibilities *etc.*)
- **High-gradient Cavity Production** (develop the technology for routine high-gradient cavity production on the basis of the industrial cavity production process for the XFEL; establish process on ~30 fully dressed cavities; enable the decision for the operating gradient of the ILC)

HELMHOLTZ GEMEINSCHAFT