



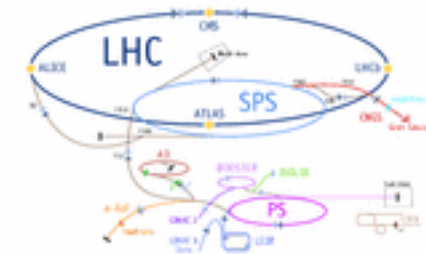
Perspectives for European LC R&D

E.Elsen



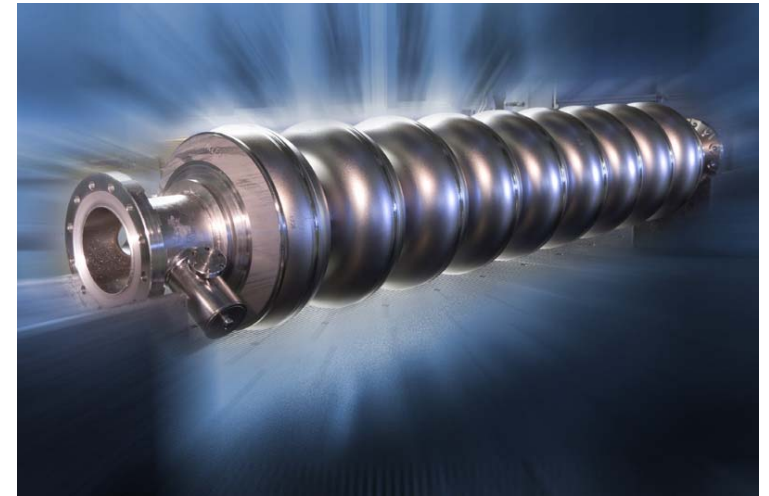
European Framework 2007-2011

- LHC –
is the European flagship project and obligation
 - Start-up 2007
and 2008 @ full energy
 - Success is paramount for the field
 - Funds are constrained till 2011 –
and beyond depending on chosen priorities
- Additional funds for ILC activities will depend
entirely on extra sources
 - National programmes
 - EU funding
 - O(M), not O(bn)



Significance of European Contributions to ILC

- Europe is the home of large scale SCRF developments (TESLA collaboration)
 - Technology will be applied @ XFEL, a 1 bn€ project and de facto a 5% prototype of the ILC
 - Make best use of what can be learnt from XFEL
- Europe has a lot of experience in accelerator construction in facilities that come to the end of their life cycle (HERA, DAPHNE, ...). There is tremendous activity in light source development:
 - Select a few key areas where Europe can actively contribute
- Secure the funding in strategic areas



Will await Beijing meeting for global guidance...

ESFRI* - European Roadmap

- ...should describe the scientific needs for Research Infrastructures for the next 10-20 years, on the basis of a methodology recognised by all stakeholders, and take into account input from relevant inter-governmental research organisations as well as the industrial community.
- The Council stresses that this roadmap should identify vital new European Research Infrastructures of different size and scope, including medium-sized infrastructures and those in the fields of humanities and bio-informatics, such as electronic archiving systems for scientific publications and databases.



*European Strategy Forum for Research Infrastructures (governmental representation)



	Projects (in alphabetical order per discipline)	Estimated Construction Cost (M€) *	First possible operations for users	Indicative Operational/Deployment Cost (M€/year)	Description
Humanities & Humanities	COANDA	30	2026	6	Facility to provide and facilitate access of researchers to high quality data for social sciences
	CLARIN	108	2026	18	Research infrastructure to make language resources and technology available and useful to scholars of all disciplines
	DARPP	10	2026	4	Digital infrastructures to study the evolution of cultural heritage institutions
	ERDF	43	2026	13	Centralised distributed facility to collect and ensure cooperation and integration of data, technologies and policies
	EU: European Social Survey	9	2027	3	Upgrade of the European Social Survey (set up in 2007) to monitoring team changes in social values
	SH-IR	50	2027	4-7	Open Infrastructure for empirical economic and social science analysis of the on-going changes due to population ageing
Environmental Sciences	AURORA SCIENCE	160	2020	18	European Polar Research Infrastructure
	EMSC	50	2021	38	Multi-disciplinary Earth Observation (3-dim)
	ELMIR	50-100	2027	2-4	Long Range Deep-sea Earth System (LDES) or Arctic-DEEP
	EURO SWH (SUSBA)	76	2020	6	Ocean Cleaning buoy system (deployment over 12 years)
	EURO SWH (SUSBA)	20	2026	6	Climate Change Observation for Environmental Arctic Observations
	EURO SWH (SUSBA)	155	2020	13	Integrated Carbon Observation System (deployment over 12 years)
Energy	EMIRACOM	170	2024	28	Infrastructure for research on the production, management and sustainable use of electricity
	EPIC	150	2021	18	High Power laser pulse laser for laser light fusion
	EPIC (SUSBA)	155	2022	18	High Power laser pulse laser for laser light fusion
	JUP	100	2024	18	High Power laser pulse laser for laser light fusion
	MYRI	165	2020	18	High Power laser pulse laser for laser light fusion
	Laserer Research and Materials Research	70	2023	18	High Power laser pulse laser for laser light fusion
Biomedical and Life Sciences	EMIRACOM	120	2023	18	High Power laser pulse laser for laser light fusion
	EMIRACOM	120	2023	18	High Power laser pulse laser for laser light fusion
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Material Sciences	EMIRACOM	120	2023	18	High Power laser pulse laser for laser light fusion
	EMIRACOM	120	2023	18	High Power laser pulse laser for laser light fusion
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Astronomy, Astrophysics, Nuclear and Particle Physics **	EMIRACOM	120	2023	18	High Power laser pulse laser for laser light fusion
	EMIRACOM	120	2023	18	High Power laser pulse laser for laser light fusion
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	EMIRACOM	120	2023	18	High Power laser pulse laser for laser light fusion
ICT	EMIRACOM	120	2023	18	High Power laser pulse laser for laser light fusion
	EMIRACOM	120	2023	18	High Power laser pulse laser for laser light fusion

European XFEL

IRUVX-FEL

FAIR

LHC & ILC

IPB = not yet defined
 NA = not applicable - already covered within the current budget
 CAI = Computer and Data Infrastructure

** For several projects the cost indicated will still need further refinement on the basis of more detailed technical and financial studies to be carried out
 *** Projects related to particle physics are open to discussion on their location to CERN and INFN respectively websites

Particle Physics in the ESFRI Roadmap

- Particle physics stands on the threshold of a new and exciting era of discovery. The next generation of experiments will explore new domains and probe the deep structure of space-time. European particle physics is founded on strong national institutes, universities and laboratories and the CERN Organisation. The CERN Council created a Strategy Group which elaborated a Roadmap for the needs of the field, with the following major elements (as reference):
 - The Large Hadron Collider LHC at CERN will be the energy frontier machine for the foreseeable future and should fully exploit its physics potential.
 - **It is fundamental to complement the results of the LHC with measurements at a linear collider. In the energy range of 0.5 to 1 TeV, the ILC, based on superconducting technology, will provide a unique scientific opportunity at the precision frontier.**
 - It is also vital to strengthen the advanced accelerator R&D programme.

Overview of Infrastructure Instruments

Existing Infrastructures	New Infrastructures
Integrating activities	<p>Design studies ---</p>
e-infrastructures	<p>Cooperation (call phase)</p>
Policy Development and Programme Implementation	

n.a., ILC beyond "design phase"

ESFRI Roadmap

530 M€
2007-13

http://cordis.europa.eu/fp7/dc/index.cfm?fuseaction=UserSite.CapacitiesDetailsCallPage&call_id=15

Seventh Research Framework Programme (FP7)

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Capacities : Call for Proposals

Research Infrastructures

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FP7-INFRASTRUCTURES-2007-1

Identifier: FP7-INFRASTRUCTURES-2007-1

Publication date: 22 December 2006

Budget: € 106 400 000

Deadline: 02 May 2007 at 17:00 (Brussels local time)

OJ Reference: [OJ C316 of 22 December 2006](#)

Specific Programme: [Capacities]

Theme: [Research Infrastructures]

Restrictions to Participation: see eligibility criteria in the Work Programme

106.4 M€

May 2nd, 2007



FP7 – Preparatory Phase

- View of the Commission
 - Member states not necessarily need the EC support...nevertheless, FP7 could help in **facilitating decision making**
 - Targeted at resolving bottlenecks in decision-making
 - First call restricted to the projects identified in the 2006 ESFRI roadmap
 - One proposal per topic is expected
 - Scientific Officer for CERN Council projects is D Pasini
 - assistance in proposal writing
 - LHC upgrade and ILC considered sufficiently mature
 - These two will be separate proposals
 - CLIC and v-facilities not ready at this time



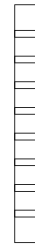
Stage 1 – Preparatory Phase

- Solely for projects on the ESFRI list, i.e. including CERN Council list
- Budget for first call: 106 M€
 - EC financial contribution ~4 M€ per project
 - Contract duration 1-4 a
 - First call issued Dec 22, 2007, closure May 2, 2007
 - Streamlined review of proposals.
 - First contracts to come into force before end 2007, first instalment could be available before 2008

Stage 1 – Preparatory Phase

- Work focus expected on

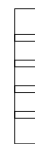
- legal
- governance
- strategic
- financial issues



*for ILC largely covered by
GDE at the international level*

- Technical work also possible but **cannot** be the core of the preparatory phase project

- prototypes or
- engineering



*work targeted towards
construction*

Stage 1 – Preparatory Phase

- Participants
 - ministries, governments
 - research councils, funding agencies from interested countries and
 - research centres, universities, industries
- Minimum 3 participants from 3 member States or Associated States

Will have to involve governmental agencies for the ILC

Elements of a European ILC Programme

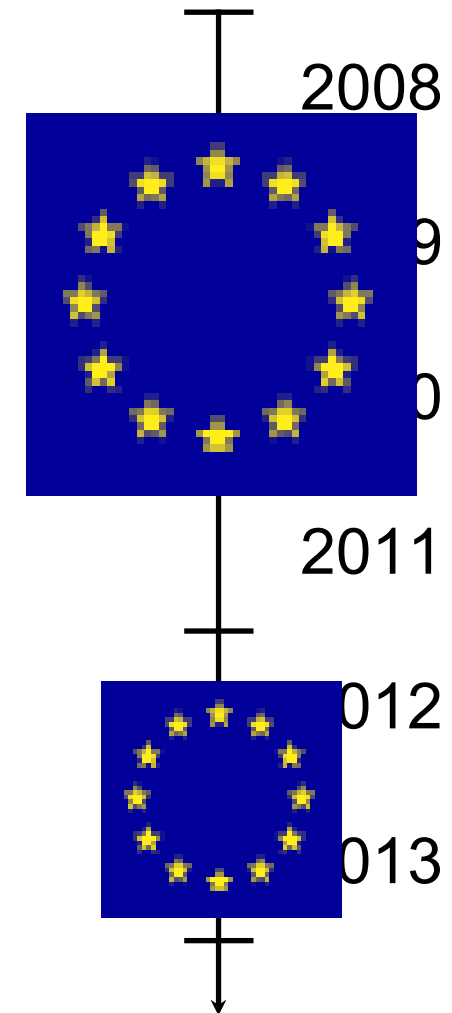
- SC RF cavities need to be advanced to a state
 - that guarantee a high gradient
 - that makes the production affordable

The core of the European FP 7 programme must be centred around the programme where

- Europe has the lead
- Europe commands respectable infrastructure
- XFEL
- infrastructure at CERN (requires refurbishment)

ILC needs for the period 2007-2013

- Post-RDR
 - reference design will have been established
- EDR-contributions
 - optimisation of designs
 - site specific activities
 - in Europe
 - outside of Europe
 - site specific layout
- Prototyping and pre-construction work



Letter to the Strategy Group

15 March 2006

Letter of Intent about a European SC RF Facility

To: CERN Council Strategic Planning Group

From: European partners of the TESLA Technology Collaboration and other interested institutions

Subject: European Super-Conducting RF Facility

The European partners of the TESLA Technology Collaboration and other interested institutions intend to propose a new European SCRF facility to be built and operated in the EU 7th Framework Program (FP7) by a collaboration of all interested European laboratories and institutes. This facility would permit to build and test high performance SCRF structures and to integrate them into modules.

Further "Instruments" in FP7

- For new research infrastructures (incl. major upgrades)

- Design Studies

- Preparatory Phase of New Infrastructures



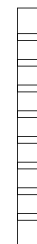
2007

- For existing research infrastructures

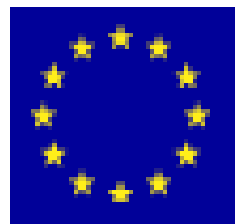
- Transnational Access

- Integrating Activities

- ICT based e-infrastructures



2nd round



Relating ILC activities to EC programmes...

	EUROTeV	FP7 PP 07	FP7 IA 08	ICT 08	FP7 Construction
	2005-7(8)	2008-11	2009-12	2007-10	2010-13
EUROTeV	X	X		X	
SCRF		X	X		X
EDR		X			X
GDE		X			

Outlook

- The European contribution to the ILC for the next few years will not be a single source O(100 M€/a) contribution
- There are various scenarios that allow for significant
 - synergetic
 - strategic
 - focussed
- contributions to the programme so that the European contribution remains comparable with the other regions
- Alliance / consortium building has to start now and the first is realizing a strong FP7 PP proposal