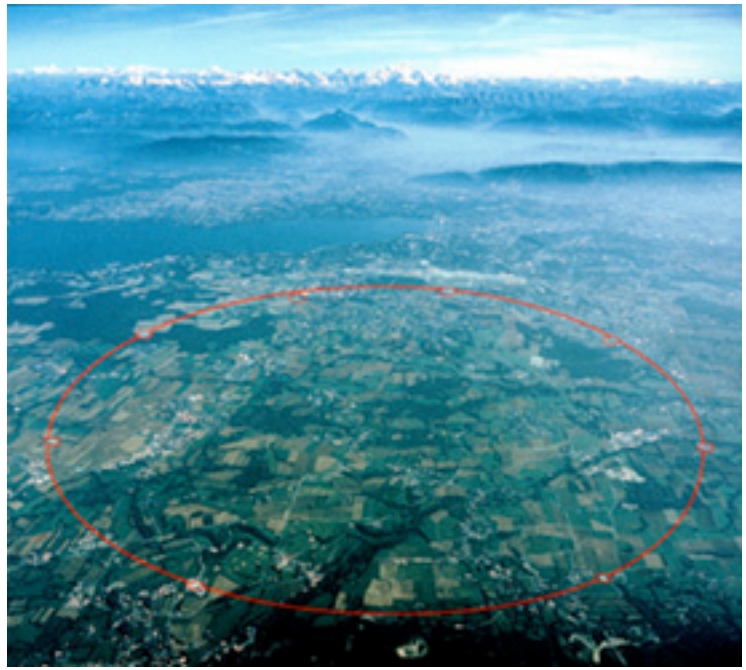
Perspectives and Planning for European LC R&D

E.Elsen

GDE Meeting, Beijing, Feb 2007

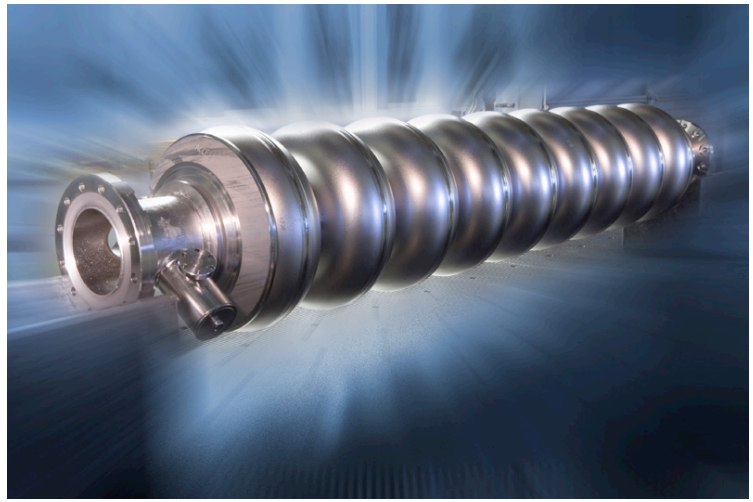
European Framework 2007-2011

- 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 from facilities that now come to the end of their life cycle (HERA, DAPHNE, …). There is tremendous activity in light source development and, of course, LHC (and CLIC)
  - Select a few key areas where Europe can actively contribute
- Secure the funding in strategic areas



This GDE meeting beginning of the post-RDR phase.

Letter to the CERN Council 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.

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→ Short introduction into European Commission Programmes

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)

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	Projects (in alphabetical order per discipline)	Estimated Construction Cost (M€) *	First possible operations for users	Indicative Operational/ Deployment Cost (M€/year)	Description
Social Sciences & Humanities	CESSDA	30	2008	6	Facility to provide and facilitate access of researchers to high quality data for social sciences
	CLARIN	108	2008	10	Research Infrastructure to make language resources and technology available and useful to scholars of all disciplines
	DARIAH	10	2008	4	Digital infrastructure to study the sources in cultural heritage institutions
	EROHS	43	2008	12	Central and distributed facility to promote and ensure cooperation and integration of data, technologies and policies
	ESS : European Social Survey	9	2007	9	Upgrade of the European Social Survey (set up in 2001 to monitor long term changes in social values)
	SHARE	50	2007	< 1	Data infrastructure for empiric economic and social science analysis of the on-going changes due to population ageing
Environmental Sciences	AURORA BOREALIS	360	2010	18	European Polar Research Icebreaker
	EMSO	150	2011	20	Multidisciplinary Seafloor Observatory (5 sites)
	EUFAR	50 - 100	2007	2 - 4	Long Range Tropospheric Aircraft (options: C130 or Airbus 400M)
	EURO ARGO (GLOBAL)	76	2010	6	Ocean Observing buoy system (deployment over 12 years)
	IAGOS-ERI (GLOBAL)	20	2008	6	Climate Change Observation from 20 commercial aircrafts (deployment)
	ICOS (GLOBAL)	255	2010	13	Integrated Carbon Observation System (deployment/operation over 20 years)
	LIFE WATCH	370	2014	70	Infrastructure for research on the protection, management and sustainable use of biodiversity
Energy	HIPER	850	2015	80	High Power long pulse Laser for "fast-ignition" Fusion
	IFMIF (GLOBAL)	855	2017	80	International Fusion Materials Irradiation Facility
	JHR	500	2014	30	High flux reactor for Fission Reactors Materials Testing
Biomedical and Life Sciences	EATRIS	255	2010	50	Network of new research centres to translate basic discoveries into clinical interventions in major diseases
	European Bio-banking and Biomolecular Resources	170	2009	15	Network of existing and new biobanks (samples and data from patients and healthy persons) and molecular resources
	INFRAFRONTIER	320	2007	36	Distributed infrastructure for the archiving and phenotyping of mice as models for studying human diseases
	Infrastructure for Clinical Trials and Biotherapy Facilities	36	2007	5	Network of clinical research centres, clinical trials and biotherapy facilities for therapeutic innovations
	Integrated Structural Biology Infrastructure	300	2007	25	Network of centres for integrated structural biology (protein production, NMR, crystallography, microscopy)
	Upgrade of European Bio-Informatics Infrastructure	550	2007	7	Shared platform for data resources in the Life Sciences (based on a major upgrade of EBI)
Material Sciences	ELI	150	2013	6	Extreme Light intensity short pulse Laser
	ESRF Upgrade	230	2007-2014	NA	Upgrade of the European Synchrotron Radiation Facility (in 7 years)
	ESS: The European Spallation Source	1050	2017	80	European Spallation Source for neutron spectroscopy
	European XFEL	986	2013	84	Hard X-ray Free Electron Laser in Hamburg
	ILL 20/20	160	2012-2017	NA	Upgrade of European Neutron Spectroscopy Facility (in 2 phases)
	IRUVX-FEL	760	2006-2015	70	Infrared to soft X-rays complementary Free Electron Lasers (in 5 users facilities)
	PRINS	1110	2008-2013	256	Paneuropean Infrastructure for Nanostructures and Nanoelectronics
Astronomy, Astrophysics, Nuclear and Particle Physics **	ELT: The European Extremely Large Telescope	850	2018	40	European Extremely Large optical telescope
	FAIR	1186	2014	120	Facility for Antiproton and Ion Research
	KM3NET	220-250	2015	NYD	Underwater Neutrino Observatory (in design phase)
	SKA: The Square Kilometre Array (GLOBAL)	1150	2014-2020	100	Square Kilometer Radiotelescope Array (in two phases)
	SPIRAL2	137	2011	7	Production and study of rare isotope Radioactive beams (toward the future facility EURISOL)
CDT	EU-HPC	200-400	2008	100-200	Integrated European High Power Computing Service (2 - 4 high-end centers)

NYD = not yet defined
NA = not applicable - already covered within the current budget
CDT = Computer and Data Treatment

* For several projects the cost indicated will still need further review on the basis of more detailed technical and financial studies to be carried out
** Proposals related to particle physics and space science can be found under the CERN and ESA respective websites

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European XFEL

IRUVX-FEL

FAIR

LHC & ILC

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Particle Physics in the ESFRI Roadmap

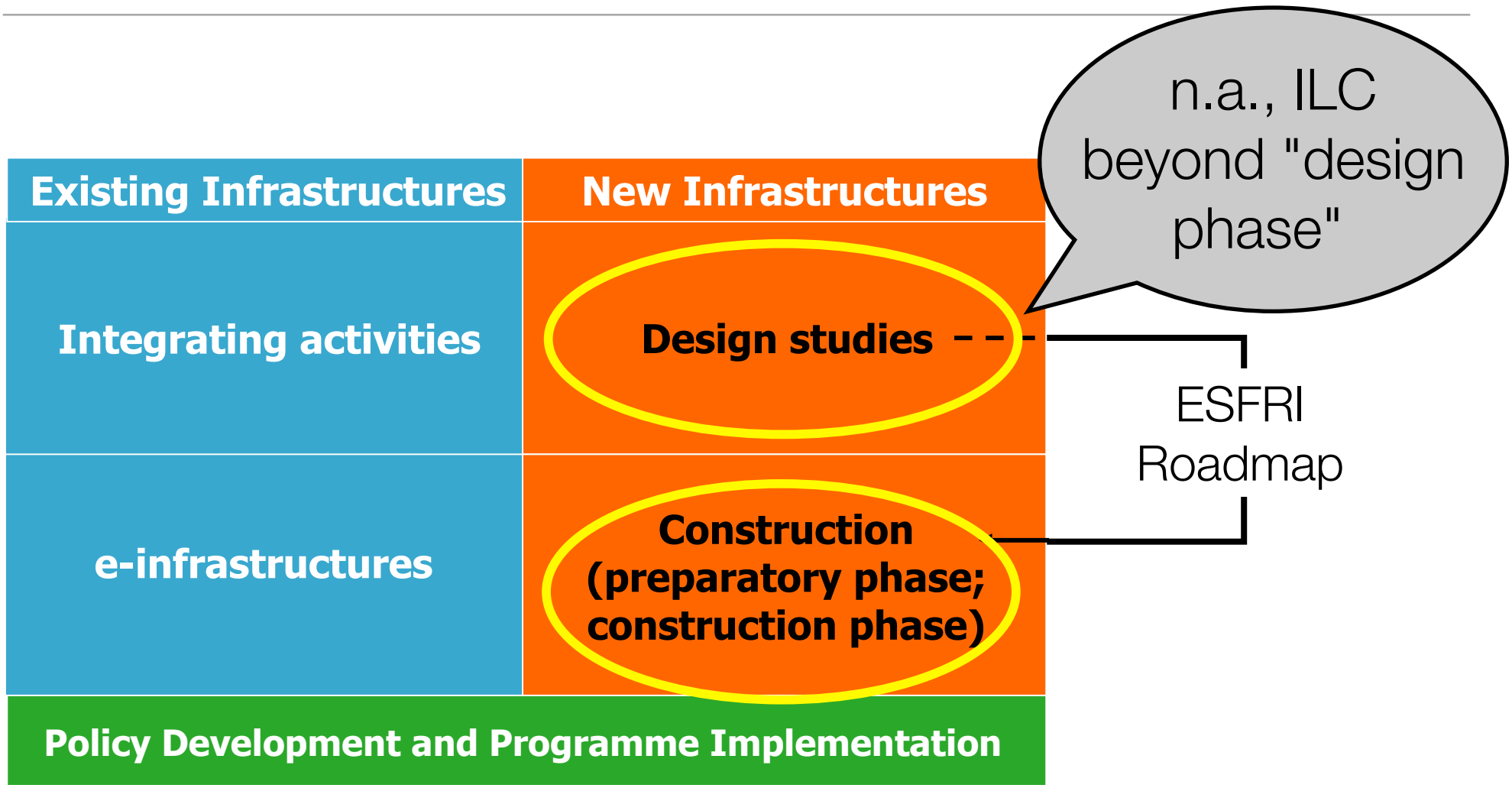
- Particle physics stands on the threshold of a new and exciting era of discovery. The next generation of experiments will explore new domains and probe the deep structure of space-time. European particle physics is founded on strong national institutes, universities and laboratories and the CERN Organisation. 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



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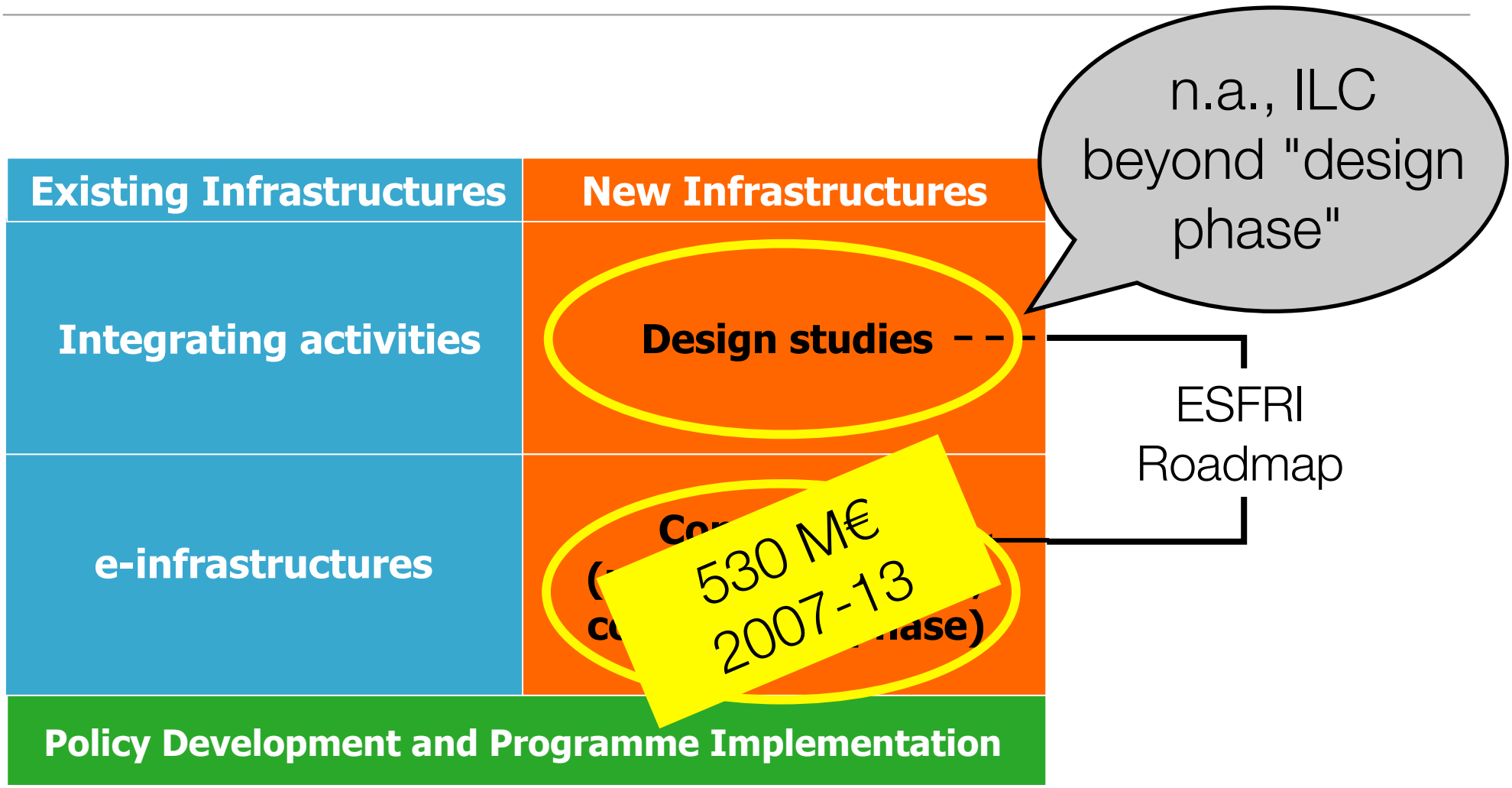

http://cordis.europa.eu/fp7/dc/index.cfm?fuseaction=UserSite.CapacitiesDetailsCallPage&call_id=15

Seventh Research Framework Programme (FP7)

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Capacities : Call for Proposals

Research Infrastructures

Preparation and Submission of Proposals | Information Package
Additional Documents | Get Support | Build Your Consortium

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

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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 ν-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 1-7 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

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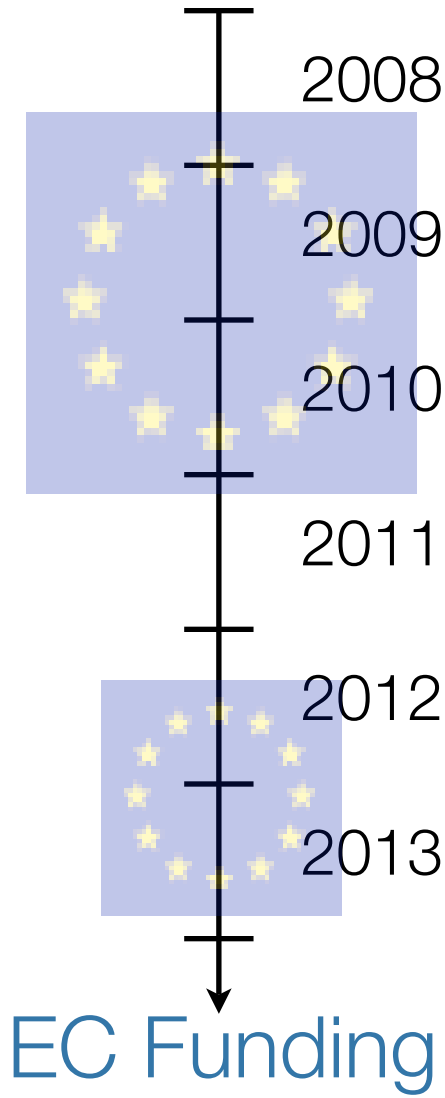
Will have to involve governmental agencies for the ILC

ILC funding for 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



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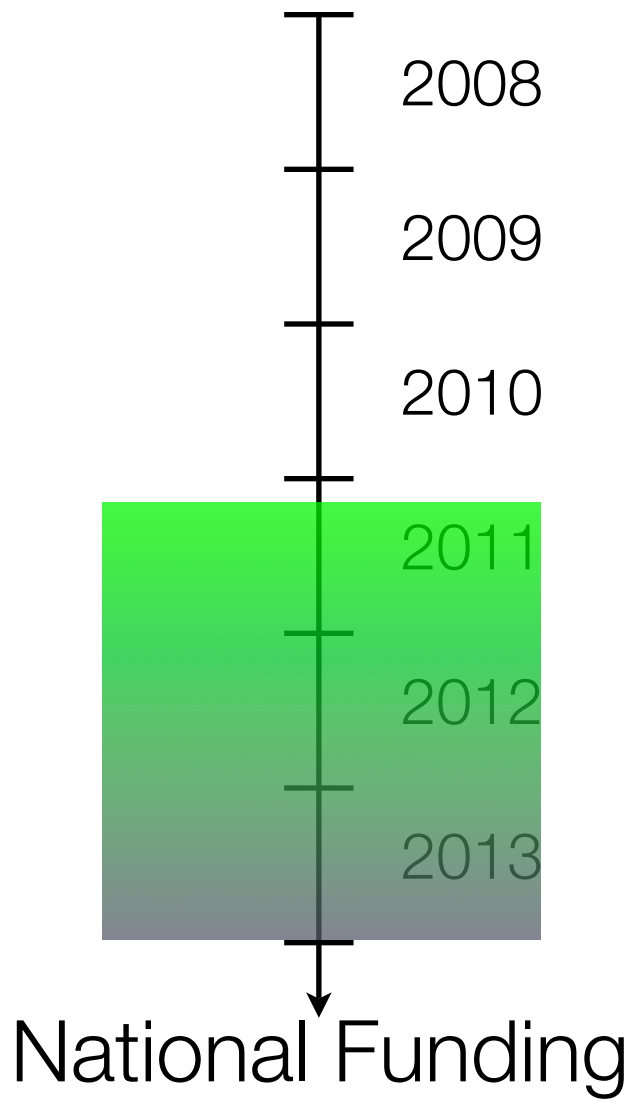

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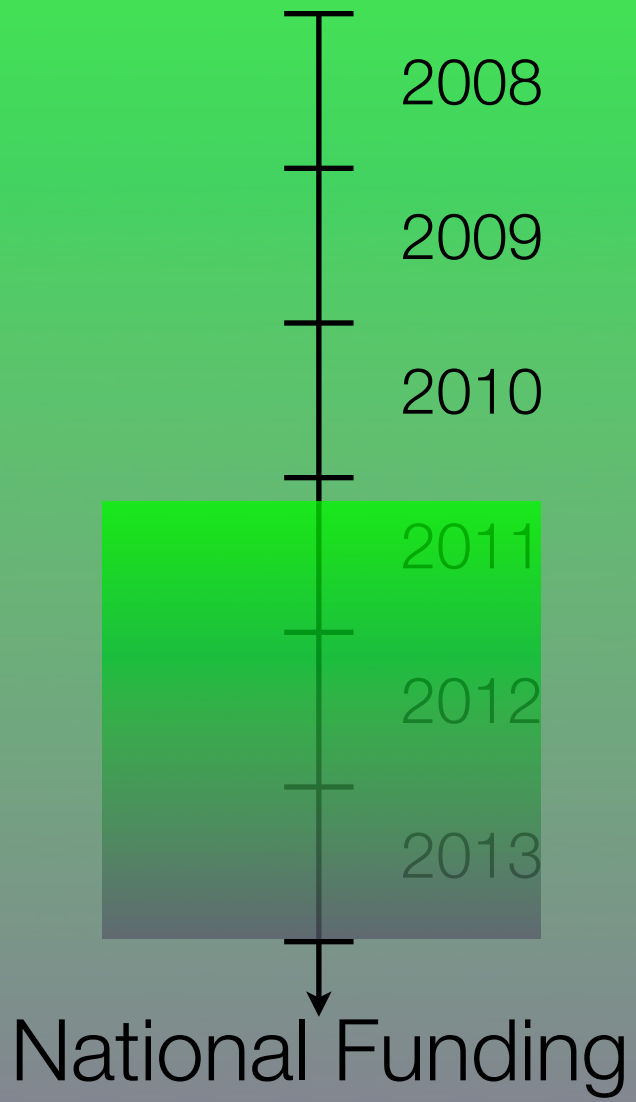

The "Instruments" in FP7

- 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…

	CARE	EUROTeV	FP7 PP 07	FP7 IA 08	ICT 08	FP7 Construc -tion
	2004-8	2005-7(8)	2008-11	2009-12	2007-10	2010-13
EUROTeV WPs*		X			X	
SCRF	X		X	X		X
EDR			X			X
GDE			X			

* EUROTeV WPs: BDS, Damping rings, e^+ source, diagnostics, beam dynamics, metrology and remote controls

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 contributions to the programme so that the European contribution remains comparable with that of the other regions.
  - EU funding for dedicated ILC projects
  - Synergetic effects with other large projects (XFEL, …)
- Alliance / consortium building has to start now and the first is realizing a strong FP7 PP proposal