# Outlook


## 2012 CERN-ECFA-NuPECC Workshop on the LHeC

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# LeHC: what next

**CDR delivered: an important milestone!**

**Next goal: TDR by ~2015.**

**In order to get there need to:**

- **Find appropriate representation in the European Strategy Update document**
- **Scale up the community and adapt the organization**
- **Get appropriate support from Cern and other participating laboratories/institutions**

# CDR Model

2008-2012

Scientific Advisory Committee

CERN
ECFA
NuPECC

**Steering Group**

| Accelerator | Interaction Region | Detector | New Physics | QCD and Electroweak | High Parton Densities |
|---|---|---|---|---|---|

Organisation of the LHeC Conceptual Design Report

# R+D Tasks for LHeC

2012-2015

| Physics | Detector | Computing | IR | CE | RF+Cryo | ERL | Magnets |
|---|---|---|---|---|---|---|---|
| Stimulate new DIS physics | Performance (precision, acc.) | Physics processes | Pipe for 1° | Site specific linac design | Cavity-cryo module (Q) | Beam dynamics | Q design and prototypes |
| t,Higgs,RPV.. | Technical design | Computing model, support | Syn.radiation, beam backgrd | Junction of e,p beam lines | Cryogenics system design | Protection, dumps | Return arc magnets |
| Adjust to LHC | Prototypes | Simulations | Masks, collimators.. | Technical integration | Power, coupler | Electron source | Rotator |
| Tool development | Installation model | DAQ and Trigger | Fwd and bwd detectors | Power, GS.. | Test facility | Positron R+D | Integration |

# R+D Tasks for LHeC

LHCC
MAC/LMC

2012-2015

ECFA
NuPECC

| Coordination |
| --- |
| Enable decision by 2015 ("TDR") |
| Oversight of Physics, Detector, Accelerator Issues. Finances |
| CERN + International Collaborations on Detector + Accelerator |
| Response to CERN Directorate and Committees, Conferences etc. |

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| --- | --- | --- | --- | --- | --- | --- | --- |
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# The LheC study group

The LHeC study group has the mandate of **preparing in 2012, a proposal to the European Strategy Group, in which the LHeC project can be considered for evaluation as one of the future European collider projects**.

This will entail, over the coming three years, **the development of the key technological components required for the Linac-Ring option, such that a final decision on the project can be taken at the time in which first results of the LHC 13-14 TeV operation will become available.**

# The LheC study group

The mandate for the technology development **includes studies and prototyping of the following key technical components:**

- Superconducting RF system for CW operation in an Energy Recovery Linac, (high Q0 for efficient energy recovery). The studies require design and prototyping of the cavity, couplers and cryostat.
- Superconducting magnet development of the insertion regions of the LHeC with three beams. The studies require the design and construction of short magnet models.
- Studies related to the experimental beam pipes with large beam acceptance in a high synchrotron radiation environment.

# The LheC study group, cont

- The design and specification of an ERL test facility for the LHeC.
- The finalization of the ERL design for the LHeC including a finalization of the optics design, beam dynamic studies and identification of potential performance limitations.

The above technological developments require close collaboration between the relevant technical groups at CERN and external collaborators.

Given the rather tight personnel resource conditions at CERN **the above studies should exploit where possible synergies within existing CERN studies** (e.g. SPL and ESS SC RF, HL-LHC triplet magnet development and collaboration with ERL test facility outside CERN ).

# Physics and detectors

- Less structured plans so far.
- Ideas from the community welcome
- Again, explore synergies with other R&D programs, and the LHC detector upgrades
- Resources from the EU financed Design Studies eagerly needed.

# In summary

- So far so good
- Next immediate steps clear
- A lot of work in front of us…
- …and a lot of fun also!