

Task 5.3: Cost Model

Title	: Develop dipole magnet cost model
Participants	: CERN – CEA – CIEMAT
Deliverable	: D-5.3 «Cost model for dipole magnet», deadline M39
Milestone	: no associated milestones

Description

The model will explore and possibly combine analytical approaches (based on materials and production features) and extrapolation of available data of past projects, in particular the LHC. The major cost drivers will be identified and specifically discussed.

The model shall include three baselines: optimistic, likely and conservative.

Remarks

1. The cost of these magnets will be strongly dominated by the conductor and the coil manufacture.
2. Though the deliverable is due by M39, we shall provide feedback for the evaluation of the design options (M10).
3. The FCC will be unique: the cost models elaborated, at different level of complexity, for other projects like HE-LHC, VLHC can certainly provide ideas for the work, but remain far from being a reference for this new project. The closest experience to the FCC remains the LHC and partly, the HL-LHC.

Program

1. As both CEA and CIEMAT will be engaged from the beginning in the design options (blocks and common coil respectively), it is proposed that, based on the experience of the LHC dipoles, CERN will set-up a simplified analytical model to be used at M10 for providing feedback for the evaluation of the design options.
2. Afterwards, CEA and CERN will be jointly work on an advanced analytical model. The work will be conducted by iterating and combining approaches and assumptions initially elaborated separately by the two institutes, thus maximizing creativity as well as minimizing the risk of missing important elements of the model.
3. CIEMAT will work in the definition (if this is possible) of a scaling law based on past projects (for example magnets cost as a function of beam energy, or other) and will participate with CEA and CERN in the cross-check and validation of the analytical model with respect to past projects.