

CERN

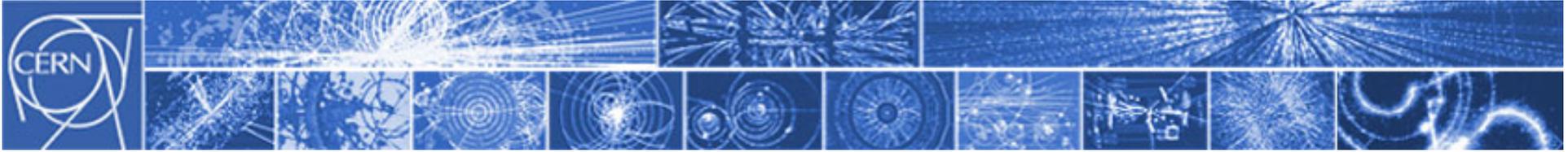
European Organization for Nuclear Research
Organisation Européenne pour la Recherche Nucléaire

Medium Term Plan for the period 2012-2016 and Draft Budget 2012

CERN/SPC/970 – CERN/FC/5534 – CERN/2970

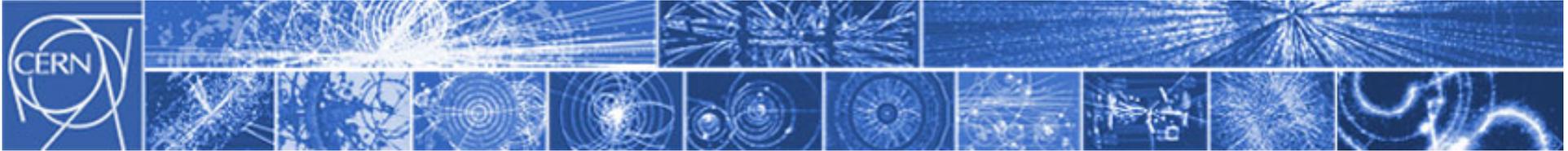
Director General

Director of Administration and general Infrastructure



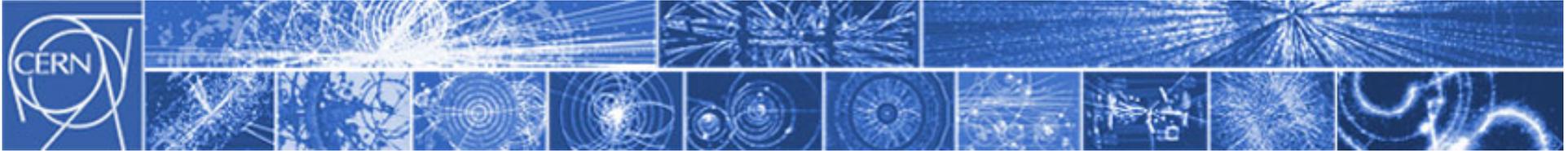
Introduction

- **Objectives unchanged** wrt previous MTP (approved 9/2010), but schedule of projects adapted to resources available
- **Objectives adjusted** on emerging physics opportunities, in particular
 - LHC schedule
 - AD / ELENA
- **Objectives adjusted** to urgent consolidation needs “popping up”
 - Sanitary blocks
 - Leaking roofs
 - Asbestos removal
 - Waste management



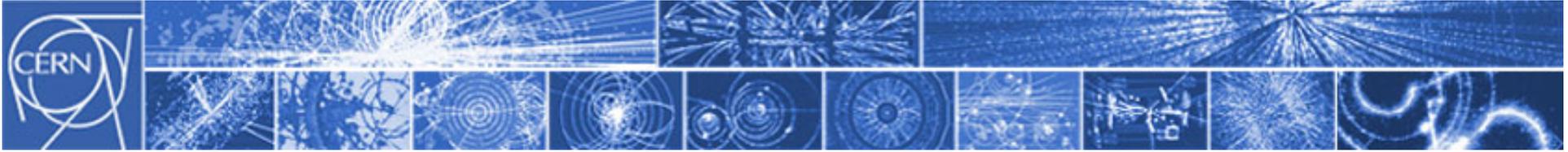
Key changes with respect to last year's MTP

- Romania became Candidate for Accession (4 MCHF in 2011, 46 MCHF in 2012-2016)
- Other revenues aligned to 2010 out-turn (10 MCHF integral)
- This allows for funding
 - CERN share on ELENA (19 MCHF integral out of 23 MCHF)
 - Unavoidable urgent consolidation (leaking roofs, facades, sanitary blocks, 8 MCHF integral)
 - Control Centre Consolidation and building (Prevessin site, 14 MCHF)
 - R&D for HL-LHC (about 17 MCHF)
 - Diversity office (2 MCHF integral)
- Application of negative CVI => impact on deficit and M/P ratio
Less than 200 MCHF deficit at the end of the projection period
- Shutdowns moved by ~1 year (i.e. 2013/2014 and 2017/2018)
no impact on overall budget but re-profiling of consolidation and energy headings



LHC-Schedule

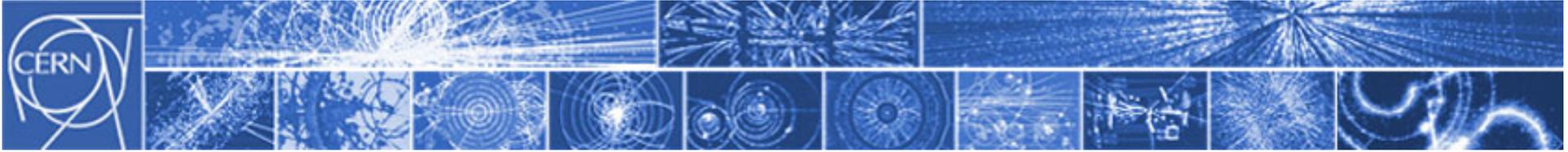
- 2011-2012: LHC data-taking at 7 TeV CoM
- **2013-2014: Long Shutdown 1**
Consolidation splices, vacuum valves, collimation, detector consolidation (IBL for ATLAS, pixel detector for CMS), injector improvements, etc.
- 2014/5-2017: LHC data-taking at up to 14 TeV CoM
- **2017-2018: Long Shutdown 2**
Collimation, detector improvements, connection LINAC 4, [LIU project \(not fully funded\)](#)
- 2018/9-2021: LHC data-taking at design energy and design luminosity
- **2021-2022: Long Shutdown 3 to install HL-LHC (not funded)**
Detectors upgrade (previous phase 2), new insertions and inner triplets, cryo-upgrade, possibly LIU, etc.
- Afterwards: HL-LHC data taking aiming for $>250 \text{ fb}^{-1}$ p.a.



Preparation for the future:

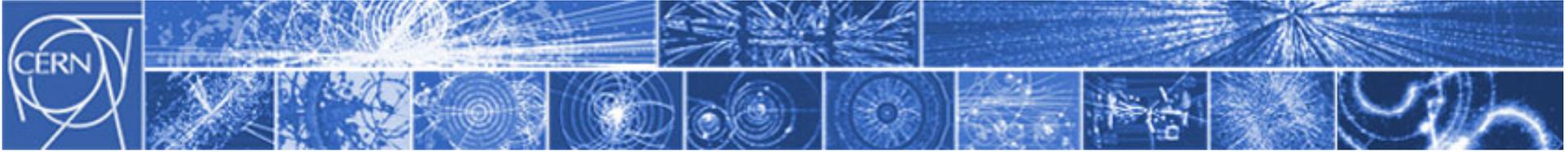
only R&D funded in this MTP
(no prototyping or construction)

- CLIC conceptual design report by 2012
- R&D for high-field magnets (towards HE-LHC)
- Generic R&D for a high-power SPL



Unique world-class fixed-target programme

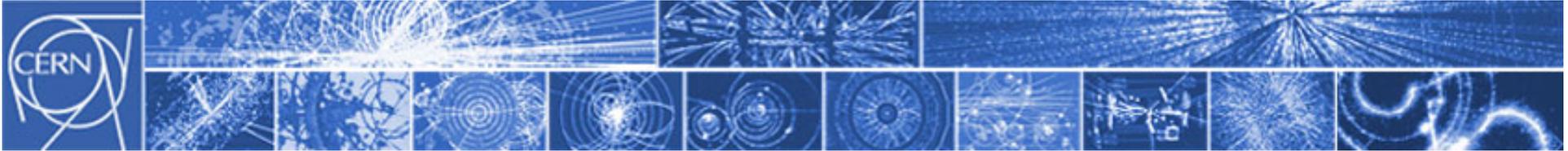
- Already planned and approved experiments at the AD, n-TOF, PS and SPS complexes including CNGS
- **New projects**
 - HIE-ISOLDE
 - ELENA
 - COMPASS2
 - Neutrino physics projects being investigated



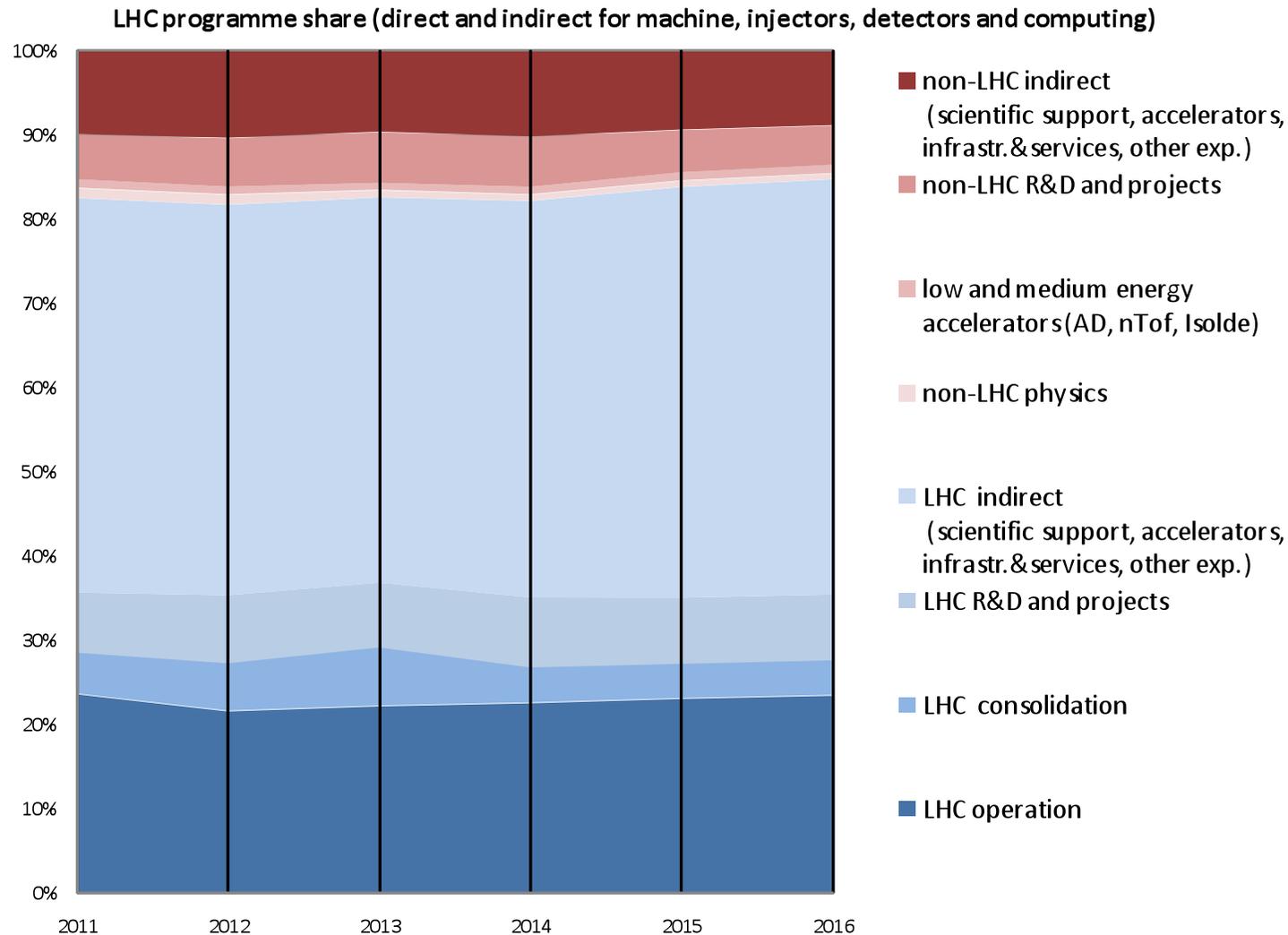
CERN is more and more a global laboratory

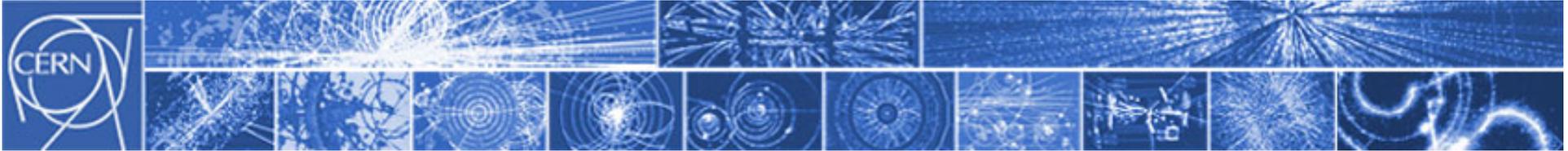
- Responsibility for the entire community
- Important challenges to CERN's infrastructure
 - Increasing need for services to users
(only funds to maintain status quo)
 - Requirements for office space/accommodation (critical path)
 - Need for consolidation and improvements of the general infrastructure (funding only for urgent repairs)

=> this is not FREE of charge and will become a continuously increasing demand in CERN's financial plan



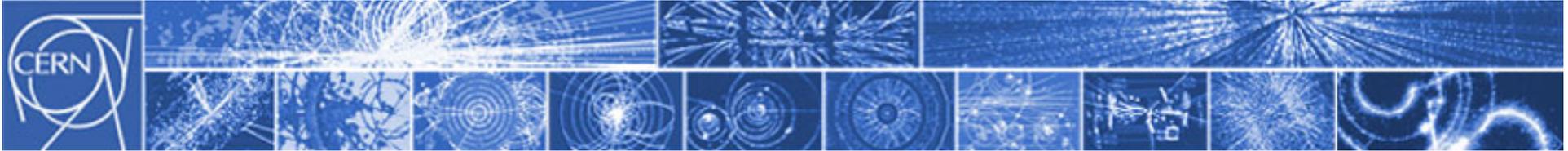
LHC importance with respect to total expenses





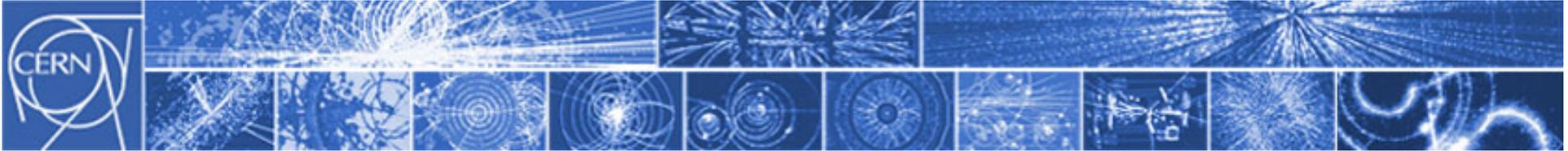
Manpower situation

- Out of the 2250 FTAs staff:
 - About 2100 FTAs are needed to ensure the running of the LHC (machine, detectors, computing, injectors) and the related infrastructure and services
 - Not enough manpower to ensure execution of projects and consolidation -> flexibility needed and used for these headings
- Fellows:
 - Graduate Engineering Fellows programme is ramping up
 - Funded through transfers from available materials to personnel inside the departments and projects
- Important support from the EU (Marie-Curie and COFUND)



Financial situation

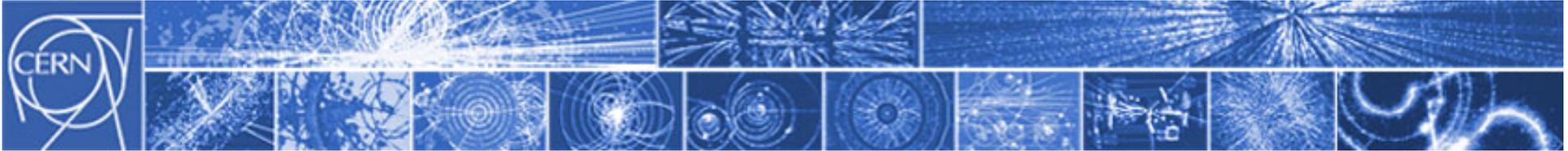
- Approved revised MTP 2010
 - Reduced MS contributions (60M/a)
 - Restoration of social security ((60+10) M)/a)
 - Reduction of budgetary deficit (20-25) M/a
 - Consolidation of LHC injectors, detectors, machine and infrastructure (with respect to MTP 2009)
 - Romania became Candidate for Accession -> a little margin
- Negative CVI applied throughout the planning period (deficit in 2015 changes from -330 MCHF to about -200 MCHF)
- New LHC schedule (delayed shutdown)
 - > expenses re-profiled from 2010 to 2011 and 2012



Financial plan 2012-2016

- **Revenues are reduced**
(as of 2012: 60 MCHF p.a. less than in 2010 in Member States' contributions, i.e. -5.2% and 0% indexation from 2010 to 2011)
- **Expenses** (average figures per annum):
 - Reliable operation** (operation, maintenance, consolidation), planned capital repayments and social security restoration correspond to **85% of revenues**
 - R&D, projects and studies** amount to **12-13% of revenues**
 - Reduction of cumulative budget deficit** corresponding to **2-3% of revenues** (on average about 25 MCHF p.a.)

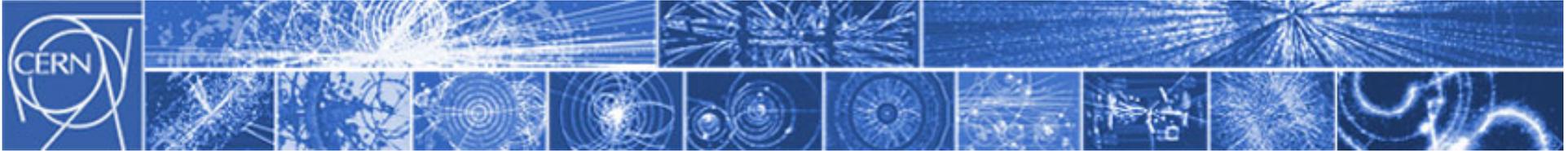
Current **MTP** *does not allow* for **funding the construction of HL-LHC** (machine and CERN share to detectors) as well as **LIU**. It further does neither allow for **more fixed-target experiments** nor for **infrastructure enhancements** and consolidation.



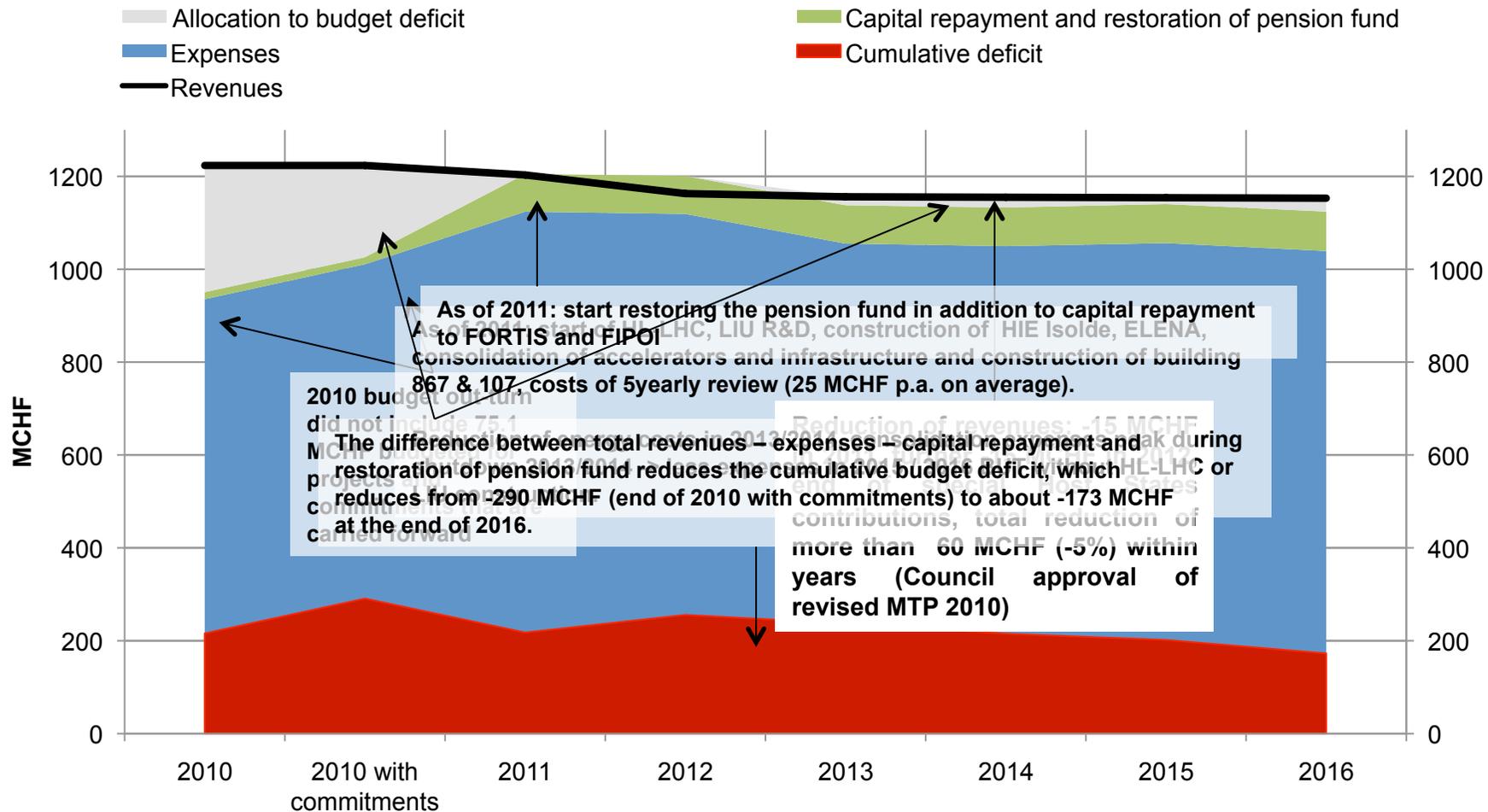
Cumulative budget deficit

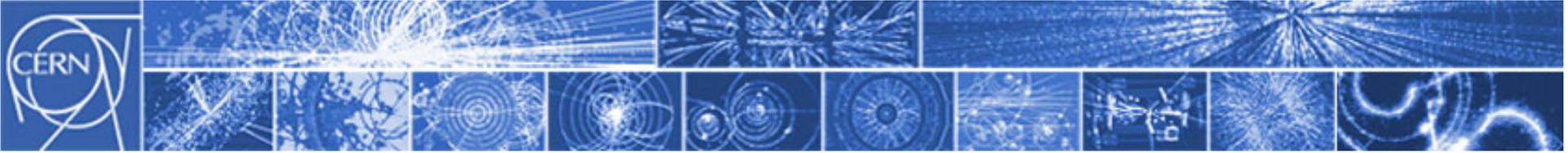
- End 2010: -216 MCHF
(and -75 MCHF carry-forward, i.e. -291 MCHF)
- Reduction to -173 MCHF by 2016
(i.e. 120 MCHF over 6 years, 20 MCHF or about 2% of expenses p.a.)
- For 2012:
 - Full energy costs for operation & preparation of long shutdown => temporary increase of the cumulative budget deficit with respect to 2011
- Comparison with last years revised MTP

[MCHF]	2010	2011	2012	2013	2014	2015	2016
Revised MTP 2010	-352.7	-340.9	-346.1	-347.9	-343.1	-329.9	
MTP 2011	-215.8 (-291 with CF)	-217.8	-255.7	-237.4	-215.3	-201.8	-172.8

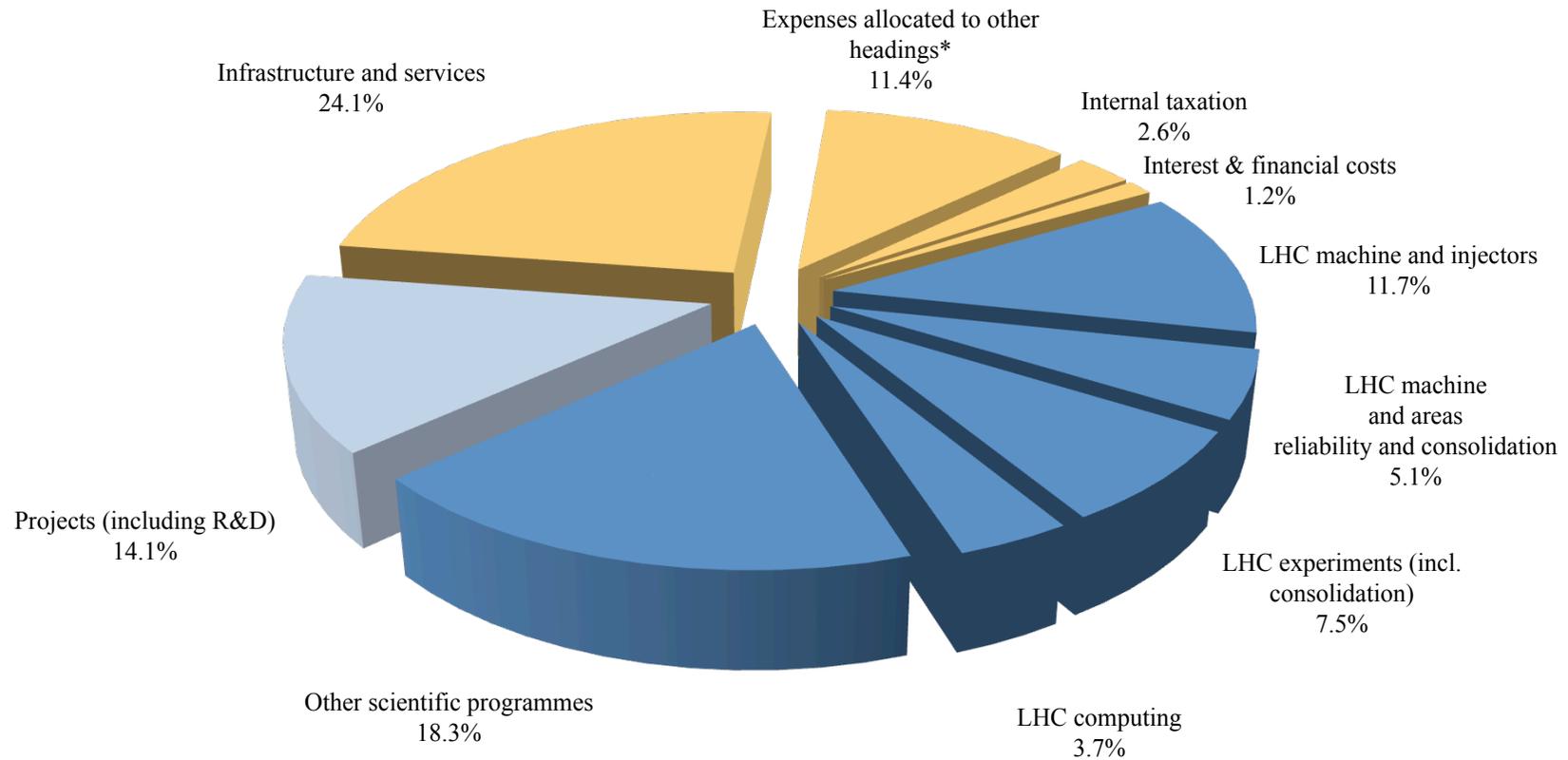


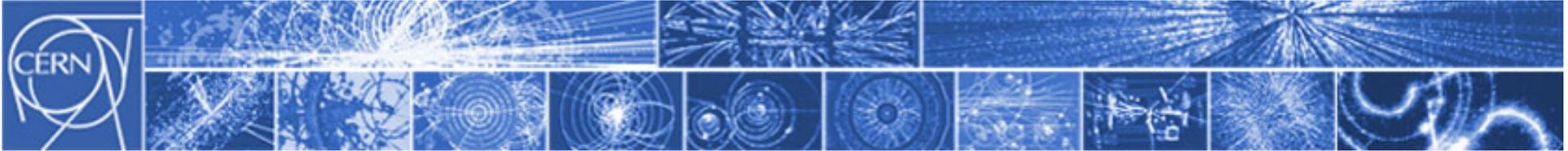
Evolution of the financial situation





Draft Budget 2012





Draft Budget 2012

- Expected positive cash flow but still budget deficit (accruals)
- Full year with operation (high energy costs) AND preparation of shutdown (industrial service expenses will increase)
- Flexibility between materials and personnel: FTA number for staff (*in research and infrastructure projects*) and the number of fellows increases – higher personnel costs
- Implementation of 2nd phase of 5yearly review and 2nd set of measures to start restoring the pension fund