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ORGANISATION EUROPÉENNE POUR LA RECHERCHE NUCLÉAIRE

CERN EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH

Action to be taken		*Voting procedure*
For discussion	**SCIENTIFIC POLICY COMMITTEE** 260th Meeting **15 June 2009**	—
For recommendation to Council	**FINANCE COMMITTEE** 325th Meeting **17 June 2009**	Chapter I and II: Simple majority of Member States represented and voting (abstentions are not counted) and 70% of the contributions of the Member States represented and present for the voting (abstentions are counted as votes against) and at least 51% of the contributions of all Member States Chapter IV: Two-thirds majority of Member States represented and voting (abstentions are not counted) and 70% of the contributions of the Member States represented and present for the voting (abstentions are counted as votes against) and at least 51% of the contributions of all Member States
For approval	**COUNCIL** 151st Session **18 June 2009**	Chapter I and II: Simple majority of Member States represented and voting (abstentions are not counted) Chapter IV: Two-thirds majority of Member States represented and voting (abstentions are not counted)

Medium-Term Plan for the period 2010-2014 and Draft Budget of the Organization for the fifty-sixth financial year 2010

GENEVA, June 2009

Finance Committee is invited to recommend the Council and Council is invited:

- **To approve the overall strategy for the reference period as presented in Chapter I and II;**
- **To take note of the Resources Plan for 2010 to 2014 in Chapter III;**
- **To approve the 2010 Draft Budget in 2009 prices as proposed in Chapter IV.**

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I. Overall Strategy

1. Executive Summary

The overriding goal during the coming years is to exploit the LHC physics potential as well as to bring CERN into a position to bid for the next large project in particle physics. This goal concerns all areas of CERN's activities, from science to infrastructure and user-friendliness, as well as governance and membership status.

This MTP is science-driven, firstly by the LHC, i.e.:

- exploitation of the physics potential of the LHC in its nominal design phase by adjusting energy and luminosity values in the light of running experience and by optimizing the schedule for physics;
- preparation of the LHC accelerator for a long operational lifetime through appropriate modifications to the machine and through the build-up of an adequate spares inventory;
- first-stage luminosity upgrade of the LHC through construction of new focusing elements in the interaction regions of ATLAS and CMS and through the construction of LINAC 4; the latter will also reduce the risk to LHC operation by replacing the ageing LINAC 2 which came into operation in 1978;
- the R&D necessary for a second stage of the luminosity upgrade of the LHC if necessitated by physics and/or running experience, i.e. development of the PS2 and of the SPL; these two new accelerators will also greatly reduce the risk to operating reliability associated with the ageing PS (in operation since 1959) and of the PS booster (in operation since 1976);
- the detector R&D necessary for the luminosity upgrades and participation in the corresponding upgrades (Phase 1) of the existing LHC experiments.

This MTP is science-driven secondly by a unique, world-class fixed-target programme, which will consist of:

- the SPS, PS, AD, n-TOF and ISOLDE experiments as already planned;
- any new projects that might emerge during the Physics Diversity Workshop in May ("New Opportunities in the Physics Landscape at CERN" workshop, devoted to general non-LHC topics) and the dedicated neutrino workshop in October and that are subsequently approved by the Council following presentation to the SPC.

This MTP is science-driven thirdly by the preparations for the future of CERN as the main global accelerator laboratory in the following areas:

- R&D for CLIC;
- enhanced CLIC – ILC collaboration;
- linear collider detector R&D in the framework of a world-wide collaboration, mandatory to arrive at a CDR for CLIC, potentially followed by a TDR for the linear collider.

This MTP is also driven by the necessity to bring the injector chain (as mentioned above) and the technical and general infrastructure to the high standards required for a world laboratory. In order to allow reliable operation of the CERN complex, the implementation of these measures necessitates bringing forward earmarked consolidation funds for the most urgent repairs.

The layout of this MTP closely follows that presented last year in order to facilitate comparison and to allow delegations, in particular, to gauge the impact of the modifications necessitated by the incident of September 19. However, for the MTP which will be produced in 2010, the Management will revisit the presentation and structure of the MTP document. For example, in order to distribute more transparently the costs related to the exploitation of the PS and SPS complex, budgetary account will be taken of the destination of the particles accelerated in these machines. In this way the running costs associated with the PS and SPS complex will be attributed (partly or wholly) to the experimental facilities (ISOLDE, CNGS, DIRAC etc) for which they provide beam. This will be part of a more general approach to reduce the number of "general" costs associated with installations.

This MTP describes the objectives from 2010 to 2014. The reasons for the variations in 2009 with respect to the 2009 Budget in the 2008 MTP are explained in a separate document.

This MTP is the outcome of the first, preliminary, assessment of operational needs by the new Management. The key changes with respect to last year's plan are:

- increased allocation for LHC operation and a new heading for the acquisition of urgently required spare parts in line with first experience of the beam and technical infrastructure operation;
- new activities: Physics Analysis Centre and linear collider detector R&D;
- bringing forward funding for the construction of a new Tier-0 Computer Centre to cope with LHC computing needs into the period 2010-2012. This will be recouped by savings in funds earmarked under the annual operation heading until 2019;

- a new auditorium and user building (subject to the securing of external funding for the period 2010 to 2012 via a FIPOI loan);
- due to the LHC incident and the delayed LHC luminosity run, a one-year delay of R&D studies and new initiatives projects to 2012;
- re-profiling of the earmarked consolidation funds for the most urgent repairs;
- as a consequence of all the above, a delay in the repayment of the LHC short-term loans from the end of 2011 to 2013.

The modifications to the resources plan with respect to the 2008 MTP also reflect a comprehensive, albeit preliminary, technical review of the costs for the operation of the LHC machine, its injectors and infrastructure. The following tables highlight the fact that a very large fraction of the CERN budget is incompressible since it is required for reliable operation, the scientific and non-scientific programme, as well as for the most urgent consolidation needs. This incompressible base-load represents about three-quarters of total revenues.

2. Additional information following the discussion in SPC in May

Following the discussion in the SPC, this chapter has been added to provide some detailed explanations on the most important issues.

LHC (Tables 2 & 10, fact sheet 1)

The integrated luminosity delivered by the LHC is given by the product of the peak luminosity, the luminosity life time and the time spent in physics data taking. The time spent doing physics is dictated by the time spent NOT doing physics. The latter is determined by the scheduled annual maintenance and the recovery time from unforeseen faults during scheduled physics. In order to maximize the yearly integrated luminosity we need to minimize the time needed for annual maintenance and have the means to perform fast repairs resulting from unforeseen faults. CERN's mode of operation of its accelerators during the past decades has typically been 8 months operation and 4 winter months of maintenance, the winter months being chosen so as to reduce the electrical consumption costs.

Experience with the present LHC repair has shown that the time needed for technical interventions is greatly increased due to access restrictions and technical incompatibilities. With the present situation, it seems almost impossible to perform the required annual maintenance in a 4-month shutdown. The restrictions and incompatibilities result from a combination of the following:

- insufficient helium storage for the whole Helium Inventory;
- present sectorization of the cryogenics system;
- possible problems with buckling of the RF fingers of the PIMS if the temperature rises above 100K;
- personnel safety and access constraints resulting from the risk of a possible repeat incident;
- safety access system inadequacies (throughput, radiation protection only).

It is also apparent from the 2009 Chamonix workshop and the external risk review that the recovery time from unforeseen faults could, in some cases, be extremely long due to:

- the lack of critical spare parts for the LHC (quadrupoles, inner triplets, DFBs, etc.;
- the lack of spare parts for the injectors and for infrastructure items, such as cooling towers, electrical network, etc.;
- component failures due to radiation induced Single Event Upsets (SEU) in the electronics presently located in the LHC service areas.

Given the uniqueness of the LHC and its experiments, the large capital investment made, and the anticipated long lifetime of the facility, it is mandatory to earmark funding to tackle the issues mentioned above.

In order to significantly improve the operational efficiency of the LHC for its anticipated working life, an annual budget of 25 MCHF from 2011 onwards has been foreseen to carry out the necessary technical modifications in particular to provide the most important spare parts. This "operational consolidation" work will obviate the necessity to operate during the winter months with the increased electrical power costs.

The "operational consolidation" budget of 25 MCHF/year is a preliminary estimate and will be evaluated in detail during 2009. The strategy for prioritizing the work will be by risk ranking: this technique has been successfully applied for consolidation of the injector chain.

The capital investments of the LHC paid by CERN amount to 3.241 BCHF and 0.432 BCHF from non-Member States contributions. Adding these, the earmarked 25 MCHF for operational consolidation spares per annum from 2011 onwards correspond to 25/3673 = 0.7% of the capital investment.

LHC upgrades (Tables 5 & 12)

The LHC luminosity will be continuously increased by a combination of enhanced operational efficiency due to better understanding of the machine and by hardware improvements and upgrades. The first of these upgrades, Phase 1, has already been approved and is currently under construction. Phase 1 upgrade consists of the construction of an improved Linear Accelerator Injector (LINAC4) and improved focusing insertions, with larger apertures, around the collision points in Atlas and CMS. The schedule for the implementation of this upgrade, which will necessitate an extended shutdown, will however depend on the future LHC luminosity evolution. The timing will be chosen so as to maximize the integrated luminosity (over a certain duration) by taking account of the luminosity lost due to the extended shutdown as well as the anticipated increase in luminosity resulting from the upgrade. It is also clear that the experiments should also profit from this extended shutdown to upgrade their detectors. Consequently the detectors need to prepare their upgrade by initiating a well planned R&D programme followed by construction and installation of the new detector components.

The current best estimate for initial operation of the Phase 1 upgrade is 2014. Resources for the approved machine upgrades as well as for the CERN part of the detector R&D and construction form an integral part of this MTP and a provision for the latter is earmarked from 2012 onwards.

The budget profile will be reviewed and adjusted as a function of the R&D progress and the LHC schedule.

A further upgrade of the machine complex (Phase 2, which will entail the renewal of a major part of the injection chain by building PS2 and SPL) is in its R&D phase. A decision on the construction will be possible once both the results from this R&D and the initial LHC physics results are available, probably in 2012-2013. Funding for the R&D (machines and detectors) is part of this MTP.

The allocation of resources takes into account the modified schedule due to the repair of the LHC.

It should however be noted that, independent of the LHC results, an in-depth consolidation of the accelerator complex needs to be carried out; the corresponding amounts are earmarked in this MTP.

Analysis Centre (Tables 3 & 10, fact sheet 9.b)

LHC data analysis will be carried out at all institutes involved in the experiments, including CERN. Analysis centres are being installed at many places around the world to extract physics results, develop new analysis methods and to foster cooperation with theory groups. CERN is in the unique position of hosting not only the LHC and all experiments involved, but also a world renowned theory group. CERN also hosts the maximum number of physicists involved at LHC at any given moment, through the many users present on site. It is of high importance to establish a Physics Analysis Centre at CERN for users and staff, for experimentalists and theorists, where the above-mentioned topics can be well and efficiently addressed in collaboration with all other analysis centres and institutes. This heading includes the former ‘white paper’ heading for additional manpower (staff, fellows and associates) and some seed funding to establish this centre.

TIER0 computing centre (Tables 2 & 10, fact sheet 7)

The capacity of the present TIER0 centre will become insufficient from 2011 onwards. The service provided by such a centre at CERN is essential for the community world-wide. Consequently, the planning and construction of a new centre must be done within the period covered by this MTP. Several options are currently under study and a final contract adjudication proposal will be submitted to the Finance Committee in due course. The budget provision foreseen in this MTP is preliminary and will be updated with the final proposal.

Linear Collider activities (Tables 5 & 12, fact sheets 16.a & 16.b)

Currently, the accelerator R&D for CLIC in an international collaboration is well under way, albeit with some negative impact due to the unforeseen incident and repair of the LHC. This has caused a delay of around half a year in the delivery of the CDR.

It is important to note that the world- wide cooperation has strongly increased through the combined working groups of CLIC and ILC.

Until now, within the world-wide study, the emphasis on detector concepts and on detector R&D has been limited to an energy range of 200 to 1000 GeV. It is now necessary to extend these studies and detector R&D to the higher energy range covered by CLIC (up to 3 TeV) and to address other relevant parameters (beam time structure, backgrounds, etc..) particular to CLIC. The new project group on linear collider detector R&D will focus on these issues, which are of key importance for the CDR and beyond.

Consolidation of general infrastructure (Tables 5 & 12, fact sheet 21.b)

The consolidation aims to improve the technical and general infrastructure, ill-maintained for decades, to the compulsory high standards required for a world laboratory. In order to allow reliable operation of the CERN complex, the most urgent consolidation work has started, as already announced at the March Council session. The MTP contains an amount of 141 MCHF during the period 2010 to 2014 in P+M for maintenance and consolidation to perform the most urgent repairs and refurbishments to be carried out.

The list of repairs and refurbishments is evaluated and prioritised based on safety, operational risks and return on investments (such as energy savings resulting from the insulation of windows, etc.). The various consolidation items are then carried out if their priority ranking falls within the yearly budget ceiling. Some examples of urgently required consolidation are:

- poorly or non-functioning heating or cooling systems;
- leaking windows or roofs;
- health risk at Restaurant 3. Without improvements, the restaurant will have to be closed;
- replacements of old and leaking underground pipework.

Amortization of accrued staff benefits

This provision for accrued staff benefits relating to saved leave and compensation for shift work was assessed for the first time in the 2007 annual accounts for the saved leave and was supplemented by the amounts relating to shift workers' compensation in the 2008 annual accounts. This first reliable assessment of overall staff benefit accruals resulted in a provision of some 170 MCHF. Thus, for the first time budget planning includes a heading to amortize the staff-benefit accruals over 10 years. It should be noted that without a separate heading for the amortization, the staff on the payroll benefiting from saved leave and compensation would have to be paid out of the normal personnel budget, thereby reducing the active staff strength well below the 2250 FTEs. The resulting effective reduction in the staff strength would mean that there are insufficient active staff numbers to fulfil the objectives of reliably running the LHC as well as preparing for the new projects. In the present situation, the new projects have been delayed by a year due to manpower shortages, and the scheduled LHC work can only be carried out by soliciting expert help from other laboratories and institutes throughout the world.

II. Scientific and Non-Scientific Programmes

LHC Programme

1. LHC Machine and Injectors

Goal	Operation of the LHC as a 14 TeV centre of mass pp collider. After the incident in sector 3-4 during September 2008 a repair and consolidation programme is underway to first prevent a similar occurrence, but also to mitigate the impact of a pressure build up in the insulating vacuum of the cold parts of the machine. This heading also includes the preparation of the PS and SPS complexes as injectors. Included here are the specific injector machines for the LHC heavy ion programme (Linac3 and LEIR).
Approval	1996
Start date	R&D 1990 Construction 1998
Costs	Cost-to-completion (Materials with in-kind contributions); 3 673 MCHF. Total Cost for Personnel & Materials (with in-kind contributions) including R&D, test and operation 5 473 MCHF.
Running conditions	Once the repair is completed, initial beam commissioning of the LHC will take place during autumn 2009 as a pp collider at 10TeV centre of mass. In order to allow a significant first Physics run the machine, together with its injectors, will be run throughout winter 2009/2010. At the end of the first proton run a period of operation with collisions of Pb^{82+} ions will be scheduled. The energy and luminosity will then be progressively increased as experience is gained running the machine.
Competitiveness	Highest centre-off-mass collisions worldwide.
Organisation	CERN, through the departments within the accelerator and technology sector manages the resources and technical operation. Technical management via a specific committee structure. Overall organization under the Directorate for Accelerators and Technology.
Risks	The stored energy in the magnets and the beam require sophisticated protection systems which must be qualified by a thorough and complete hardware testing and commissioning. As yet, no steps could have been taken to mitigate against potential pollution of the beam vacuum by an event where a vacuum chamber is pierced in a cold sector of the machine. The number and complexity of the accelerator components increase the risk for reliable operation. A review of the situation concerning spares has been launched. In many critical areas insufficient spares exist. As the luminosity is increased the risk of radiation effects on electronics installed in the machine will increase. Studies are underway and measures to remove the critical equipment into safer areas will be taken. **Failure of the PS motor generator set:** A new PS power supply is under construction and will be put into service at the end of the first LHC run. In parallel, an emergency solution with reduced efficiency was developed by which the PS could be powered directly from the 18kV supply to fill the LHC. **Failures in Linac2:** A consolidation of the RF tanks in Linac2 has already been undertaken to reduce the risk of a vacuum failure. A study to address the possible failure of a magnet in the drift tubes is underway. **Ageing of the injector chain:** Future replacement of the existing injector chain by LINAC4, SPL, and PS2.
2010 targets	For the LHC, initial beam operation from September 2009 and first collisions at high energies up to 10 TeV before the end of the year. Operation throughout 2010 with around $250pb^{-1}$ delivered to the experiments. For the injector complex the commissioning of the initial Pb82+ ion beam through the complex to the extraction from the SPS will be scheduled.
Future prospects	Progressive increase in the energy and luminosity towards the nominal values of 14 TeV and 10^{+34} cm^{-2} s^{-1}.
Longer term	A technical design review on the spares will be completed in late 2009 and a corresponding heading has been introduced in this MTP. A programme for the LHC luminosity upgrade is in place. For the machine a project to upgrade the high luminosity interaction regions is underway. For the injectors complex a new chain of machines is under study with the first element (Linac4) approved and under construction.
Specific Health and Safety issues	Losses throughout the accelerator produce some activated equipment. The beam cleaning areas and the high luminosity insertions will become particularly activated. Sites are identified for the treatment and storage of this equipment. Budget must be set aside to deal with the disposal of the radioactive waste. RP surveys all such operations.
Outreach	The LHC is highly visible in the press and public domain.
CERN budget for 2010	LHC Machine: Personnel: 64.8 MCHF, Materials: 60.6 MCHF. Sector 3-4 repair: Materiala: 10 MCHF. LHC Injectors: Personnel: 1.6 MCHF, Materials: 0.5 MCHF for heavy ions.

2. LHC Experiments: ATLAS

Goal	Verify the Standard Model and search for new physics.
Approval	January 31st, 1996
Start date	1998
Costs	Cost-to-Completion (CERN share of Materials): 128.8 MCHF; Total Personnel and Materials (CERN share, project, tests and operation until 2008 incl.): 509.2 MCHF.
Running conditions	Runs up to full design luminosity. Ready to use any luminosity provided.
Competitiveness	Together with CMS, very competitive compared to existing facilities.
Organisation	A total of 169 institutes from 37 countries with 2678 authors with PhD (or equivalent), students included. *Governing body*: Collaboration Board (one representative per member institution) and Chair. *Executive bodies*: Management: Spokesperson and two Deputies, Technical Coordinator, Resource Coordinator. Executive Board chaired by the Spokesperson. Technical Management Board chaired by Technical Coordinator. Subsystem Projects lead by Project Leaders. Physics Working Groups with two co-conveners per working group. Interface with CERN through a dedicated CERN team.
Risks	No major managerial and financial risks identified. Technical: no specific risks identified. General risk related to the operation of a very complex detector system including many different detector technologies.
2010 targets	Data taking with the complete detector at luminosities up to a few 10^{32} $cm^{-2}s^{-1}$ or higher (depending on the machine performance). With few 10 pb-1 of accumulated data, ATLAS should be able to perform first measurements of Standard Model physics processes (e.g. W,Z top-quark production). With 200-300 pb-1 ATLAS could discover supersymmetric particles with masses beyond the present Tevatron sensitivity, as well as start to explore several scenarios for physics beyond the Standard Model.
Future prospects	Physics run at high luminosity in 2011 and beyond.
Longer term	ATLAS is already planning for detector upgrades in view of LHC luminosity upgrades. For the Phase I upgrade ATLAS plans to replace the innermost Pixel layer. For Phase II, the whole Inner Detector will be replaced. A TDR for Phase I and an LoI for Phase II will be submitted in the course of 2010.
Specific Health and Safety issues	/
Outreach	Organized by the Collaboration and documented in the ATLAS Communication Plan.
CERN contribution	Infrastructure in the experimental area. Strong contribution towards the technical coordination of the experiment including the subsystem installation. Providing Tier-0 centre as well as some analysis capability. Important contributions to all sub-systems (CORE 33 MCHF) and non-CORE support (68 MCHF). A total of 128 MCHF was spent. At present, a total of 84 FTE (physicists and engineers 69, technicians 13, secretariat support 2).
CERN budget for 2010	Personnel: 20.8 MCHF, Materials: 4.5 MCHF, of which M&O: 1.7 MCHF (cash contribution to joint fund). The 2010 share of the total 9.5 MCHF earmarked for ATLAS from the detectors re-scoping heading.

3. LHC Experiments: CMS

Goal	Verify the Standard Model and search for new physics.
Approval	April 29, 1998
Start date	1998
Costs	Cost-to-Completion (CERN share of Materials): 127.8 MCHF; Total Personnel and Materials (CERN share, project, tests and operation until 2008 incl.): 488 MCHF.
Running conditions	Awaiting start of initial collisions at the end of 2009. In the meamtime, cosmic data have been taken during 2008 and will be taken later in 2009 after experiment closing until the start of the physics run.
Competitiveness	The CMS detector is a very versatile scientific instrument, capable of outstanding performances in hadron runs as well as in heavy ion runs. Compares very well with the ATLAS (hadron runs) and ALICE (heavy ion runs) experiments.
Organisation	A total of 157 institutes finance the CMS experiment, funded by 42 Funding Agencies from over 40 countries with 1825 signing scientists with PhD (or equivalent). *Governing body*: Collaboration Board (one representative per member institution) chaired by an elected Chairperson (2-year mandate). *Executive bodies*: Management Board, Executive Board, Finance Board. Spokesperson (2-year mandate), Technical Coordinator, Resources Manager, Subsystem Project Leaders. Interface with CERN through a dedicated CERN team.
Risks	No major managerial and technical risks identified. Financial: The last financing round, which covers the totality of the funds already committed, has not been fully subscribed. Some 2.975 MCHF are still to be secured. General risk related to the operation of a very complex detector system including many different detector technologies.
2010 targets	Trigger commissioning and "physics commissioning" of the detector. Then measure Standard Model processes. Search for "new" physics. Physics run at initial luminosity and 10 TeV energy, achieve high data taking efficiency.
Future prospects	Physics run at high luminosity in 2011 and beyond.
Longer term	Upgrades beyond 2009: SLHC upgrade planning has started. An initial management structure has been set up. The Collaboration has endorsed the re-scoping of the Forward Resistive Plate Chambers muon detectors. A Pixel detector upgrade is being considered for the years 2012/2013. An infrastructure upgrade is also being studied.
Specific Health and Safety issues	/
Outreach	Organized by the Collaboration and regularly reported to the Scrutiny Group for the activities financed by M&O-A.
CERN contribution	Complete responsibility for the experiment infrastructure. Leading role in the DAQ, financially and technically. Other very important contributions in ECAL, Tracker and Muon. Providing the CMS Centre infrastructure and TIER-0 facilities. Strong contribution to software tools and data analysis. Currently the CERN-CMS team is 86FTE strong.
CERN budget for 2010	Personnel: 20.0 MCHF, Materials: 3.4 MCHF, of which M&O: 1.26 MCHF.

4. LHC Experiments: ALICE

Goal	Study of heavy ion collisions: measuring properties of strongly interacting matter at extreme energy densities where the formation of a quark-gluon plasma is expected. Study of proton-proton (pp) collisions: establishing reference data for the study of the quark-gluon plasma and studying properties of pp collisions where ALICE has unique capabilities thanks to particle identification and low-p_t acceptance.
Approval	1997
Start date	1998
Costs	Cost-to-Completion (CERN share of Materials): 28.6 MCHF; Total Personnel and Materials (CERN share, project, tests and operation until 2008 incl.): 182.9 MCHF.
Running conditions	Dedicated heavy ion running during one month of a typical LHC running year at a nominal luminosity of $L \sim 10^{27}$ cm^{-2} s^{-1} at 10 Tev. Systematic pp running at reduced luminosity ($L \leq 10^{31}$ cm^{-2} s^{-1}).
Competitiveness	ALICE is the only general-purpose detector dedicated to heavy ion physics at the LHC. Complementary to experiments at RHIC (BNL, USA).
Organisation	103 Institutes from 31 countries with 557 participants with PhD (or equivalent). *Governing body*: Collaboration Board with one representative each of the participating institutes, chaired by an elected Chairperson. *Executive bodies*: Management Board: Spokesperson plus two deputies, Technical Coordinator, Resources, Computing and Physics Coordinators, Project Leaders, and elected members. Interface with CERN through a dedicated CERN team.
Risks	No major managerial and financial risks identified. *Technical*: No specific risks identified. General risk related to the operation of a very complex detector system including many different detector technologies.
2010 targets	pp physics data-taking. First Pb-Pb physics data taking.
Future prospects	Heavy ion data-taking for one month per year and pp physics data taking for the rest of the year. Completion of the installation of PHOS , TRD and EMCal modules.
Longer term	R&D started to prepare upgraded or new detectors to be installed during LHC major shutdowns for the luminosity upgrade.
Specific Health and Safety issues	Nothing specific identified.
Outreach	Organized by the Collaboration, in collaboration with ALICE CERN Team. Effort to increase visibility of ALICE.
CERN contribution	Overall scientific, technical and financial coordination, including safety. Experimental infrastructure and responsibility for installation and planning and execution of shutdown activities. Participation in detector construction projects: Si Pixel detector and level zero trigger, TPC (field cage, electronics, technical coordination), HMPID and Muon Arm (magnet). Contribution to PHOS and EmCal electronics. Financial contribution to Si Strip detector. Participation in other systems: responsibility for ECS, DAQ, DCS and infrastructure/installation, including test beam areas. Electronics coordination. Coordination of offline computing, including simulation and data processing. Development of offline computing framework, Physics coordination.
CERN budget for 2010	Personnel: 8.6 MCHF, Materials: 2.3 MCHF, of which M&O: 0.683 MCHF.

5. LHC Experiments: LHCb

Goal	Search for physics beyond the Standard Model in CP violation and rare decays of beauty and charm hadrons.
Approval	September 1998
Start date	1998 (construction)
Costs	Cost-to-Completion (CERN share of Materials): 20.5 MCHF; Total Personnel and Materials (CERN share, project, tests and operation until 2008 incl.): 121 MCHF.
Running conditions	Modest luminosity of few times 10^{32} cm^{-2}s^{-1}, compared to the LHC nominal luminosity of 10^{34} required (less focused interaction point locally tuneable). Displaced collision point in order to accommodate the spectrometer without enlarging the existing cavern at IP8.
Competitiveness	Large number of B_s mesons produced by LHC compared to the existing facilities. Efficient inclusive heavy flavour trigger and hadron particle identification compared to the other LHC experiments.
Organisation	A total of 53 institutes from 16 countries with 699 participants with PhD (or equivalent), students included. *Governing body*: Collaboration Board (one representative per member institute) and Chair. *Executive bodies*: Management: Spokesperson and Deputy, Technical Coordinator, Resource Coordinator. Interface with CERN through a dedicated CERN team.
Risks	The operation of such a complex detector inherently comprises risks; two particular risks identified: damage (mechanical or beam-related) to the beam pipe and the VELO detector. For both, mitigation actions are under way (replacement components under construction).
2010 targets	Normal data taking with complete detector at close to nominal luminosity. Physics to explore measurements where large new physics effects are not excluded, down to the level of the Standard Model expectation. With ~0.3 fb^{-1} of data expected during the first year, LHCb will already improve on the projected TEVATRON limits for $Br(B_s \rightarrow \mu^+\mu^-)$ and ϕ_s (phase of the B_s oscillation amplitude).
Longer term	LHCb has submitted to LHCC an "Expression of Interest for LHCb Upgrade". We envisage this upgrade to enable the LHCb experiment to operate at 10 times the design luminosity, i.e. at about 2×10^{33} cm^{-2} s^{-1}, to improve the trigger efficiency for hadronic decays by a factor of two and to collect a data sample of ~100 fb^{-1}.
Outreach	LHCb is placing an increasing emphasis on information services and communication networks from the experiment to the general public as well as to specifically targeted interest groups, such as students, schools and journals.
CERN contribution	CORE contribution 13.5 MCHF plus iron blocks for the Muon Filter. Total cash investment to the experiment 23.1 MCHF, which also includes providing infrastructure and R&D. A total (2008) of 58 FTE (physicists and engineers 46, technicians 11, secretariat support 1).
CERN budget for 2010	Personnel: 9.2 MCHF, Materials: 2.0 MCHF, of which M&O: 0.324 MCHF.

6. LHC Experiments: Totem and LHCf

6.a Totem

Goal	Measurement of total cross-section, elastic scattering and diffractive phenomena.
Approval	Research Board decision from July 2004.
Start date	First stable LHC beams in 2009.
Costs	Cost-to-Completion (CERN share of materials): 2.7 MCHF. Total Personnel and Materials (CERN share, project, tests and operation until 2008 incl.): 10.8 MCHF.
Running conditions	Special runs with large β^* of 90 m and 1540 m and normal LHC running conditions.
Competitiveness	The total cross-section and elastic scattering measurements have almost no competition. Diffractive studies are complementary to ATLAS and CMS, but TOTEM has the most complete proton measurements.
Organisation	A total of 10 institutes from 7 countries with 70 participants with PhD (or equivalent) *Governing body:* Collaboration Board (one representative per member institute) and Chair*Executive bodies: Management:* Spokesperson and Deputy, Technical Coordinator, Resource Coordinator. Technical Board chaired by Technical Coordinator. Subsystem projects led by project leaders. Physics group chaired by physics coordinator.
Risks	Technical risk: Roman Pot detectors very close to the beams; forward detectors close to the beam pipes with almost unknown background. For both exposure to strong radiation.
2010 targets	Complete detector installation and commissioning; Global commissioning with all subsystems; Perform the measurements as foreseen in the proposal.
Longer term	Common runs with CMS; possible upgrades: installation of a few more radiation hard Roman Pot detectors. Installation of a large GEM detector in forward region. Installation of Roman Pots in IP3.
Outreach	Spin-off from the TOTEM development of edgeless silicon detectors and VFAT chips (front-end readout and trigger) for industrial applications.
CERN contribution	Overall technical coordination for the experiment including the subsystem installation; Infrastructure in the experimental area; Leading responsibility in the Roman Pot system including silicon detectors; Some responsibility in online (incl. DCS) and offline computing.
CERN budget for 2010	Personnel: 1.4 MCHF, Materials: 0.4 MCHF, including Totem M&O: 0.2 MCHF.

6.b LHCf

Goal	Measurement of forward production spectra of pi0's and neutrons at the LHC energy for the purpose of verification of hadron interaction models for cosmic-ray physics.
Approval	June 2006
Start date	2001
Costs	Total Personnel and Materials : 2 MCHF.
Running conditions	Short low luminosity (~ 10**29) runs with < 43 bunch operations forseen at the beam commissioning. Wish to run with a beam crossing angle to enhance the covered Pt region. Runs with different energy would be also interesting to verify interaction models.
Competitiveness	Other zero degree hadron calorimeters in LHC experiments, but complementary to each other since the LHCf is dedicated to measure EM components.
Organisation	32 members, 6 countries (8 PhDs, 4 students); spokesperson, deputy spokesperson, technical coordinator, GLIMOS.
Risks	Managable risk of radiation damage: Since the LHCf detectors are not radiation hard, degradation of detectors is planned to be monitored and controlled.
2010 targets	Complete physics analysis with data taken in 2009. Preparation for the highest energy.
Future prospects	Physics run at the highest possible energy in 2011.
Longer term	Dedicated run to cover complete Pt region with a beam crossing angle. Also plannning for possible data taking in ion collisions.
Outreach	Open the information to the public using web, publicity and press releases, etc to create interdisciplinary connection between cosmic ray physics and particle physics.
CERN contribution	Overall technical coordination for the experimental infrastructure, installation, planning and execution of shutdown activities. General interface to the machine before and during data taking. GLIMOS, Computer administration and Outreach activities (2 people from EN/MEF: ~ 0.7 FTE).
CERN budget for 2010	No additional one apart from the activities above.

7. LHC Computing

Goal	Build and maintain a data storage and analysis infrastructure for the worldwide LHC physics community.
Approval	2001
Start date	2002
Costs	Total Personnel and Materials (CERN share, project and operation): 185.4 MCHF up to end 2008.
Running conditions	- Service to run 24hrs x 365 days a year, distributed infrastructure allows individual external sites to be down while maintaining overall service. - Typical data rates up to 1 GB/s from CERN to Tier 1s, equivalent rates between Tier1/2 sites. - In 2009-10 plan to manage ~500k-1M jobs per day.
Competitiveness	Largest ever computing endeavour to store and analyse massive amounts of physics data for access world-wide.
Organisation	- CERN + 11 Tier1 sites + 61 Tier 2 federations (~140 sites). - Dedicated boards (C-RRB, OB, MB, GDB, CB) and committees (LHCC, AF). - Resources mainly in IT Department, some PH, and external in the collaborating institutes. - Collaboration established with a Memorandum of Understanding signed by 33 countries.
Risks	- Power in CERN Computer Centre will no longer be sufficient during 2011. - Manpower risk from Spring 2010 after EGEE-III Project; EGI successor operation under discussion, currently ill-defined, and timescale of concern. - External pledged resources are being revised as a function of the revised experiment requirements for the post-incident schedule including longer running in 2010 – pledges risk not to meet the latest experiment requirements. - Procurement plans in some of the Tier 1 and Tier 2 centres changed as a result of the LHC incident. There is a risk that all pledges are not fully available for LHC start-up.
2010 targets	Extended production run ensuring: - Sustained transfer of LHC data (raw and processed) to tape at 1.2 GB/s (2GB/s for heavy ion running), - Data export to Tier 1 centres of up to 1 GB/s, - Successful support for chaotic data analysis (requirements not fully specified; first test of concurrent analysis work by LHC experiments in June 2009), and more generally providing a service capable of withstanding planned and unplanned incidents.
Future prospects	Increased workloads and data rates as accelerator reaches design luminosity.
Longer term	Dependent on LHC performance, experiment needs and available resources.
Outreach	- International Science Grid This Week (ISGTW) support, - Working with OpenLab partners to improve knowledge and technology transfer, - GridCafe and frequent Computer Centre tours, - LCG Public website http://lcg.web.cern.ch/LCG/public/ and updated LCG dissemination material.
CERN contribution	Tier 0 and Analysis facility to provide ~ 20% of total computer and storage resources. Project management and coordination of all activities.
CERN budget for 2010	Personnel: 17.7 MCHF , Materials: 37.9 MCHF.

Other Scientific Programmes

8. Non-LHC Physics (fixed-target programme)

Goal	**SPS fixed-targets** -**NA 62** is a new experiment to study the rare decay of charged K mesons – will request a substantial investment, with 20% from CERN (~ 6 MCHF) – R&D is progressing well, and faces an important milestone in 2009. The Giga-tracker (Si Pixels with very high rate capability) technology to be validated in 2009. - **NA 61**: proton running in 2009 in the interest of T2K collaboration. The ion programme in the future should be compatible with the LHC ion run (under study). - **NA 58, COMPASS**: approval of its hadron and of an extended DIS programme is pending for 2010 onwards. **PS fixed-targets** - **PS212 (DIRAC)**: improved electronics in 2009 to achieve successfully the study of K-pi atoms. - **PS 215 (CLOUD)**: commissioning of a new state-of-the-art large volume chamber to study the influence of cosmic rays on climate. **AD, ISOLDE, n-TOF** - **AD**: use decelerated anti-protons and positrons to measure differences if any between hydrogen and anti-hydrogen. **AD-6** is a new experiment to measure the gravitational interaction of antimatter; it will require a modest investment, with 20% from CERN (~ 0.6 MCHF). - **ISOLDE**: Study the structure of short-lived (exotic) nuclei and employ them in neighbouring disciplines (nuclear astrophysics, weak interaction studies, condensed matter physics, life sciences). - **n-TOF**: Measure neutron induced reaction cross sections of relevance for nuclear astrophysics, advanced nuclear technologies and fundamental nuclear physics. **CNGS** measuring Tau-neutrino appearance **Non-accelerator-based experiments** - **CAST**: search for axion particles from the sun, will run probably until 2010 with ^{3}HE cold bore. - **OSQAR**: an optical research for QED vacuum magnetic birefringence, axion and photon regeneration. Each of the two experiments uses a decommissioned LHC prototype dipole.
Approval	**ISOLDE**: first approved in 1964, latest approval for continuation in June 2007. **n-TOF**: first approved April 1999. **AD** latest approval for continuation in December 2008.
Start date	**ISOLDE**: first beam 1967, at present location first beam June 1992. First post-accelerated beam October 2001. **n-TOF** first beam November 2000 until 2004, resume operation end of 2008. **AD**: first beam July 2000.
Competitiveness	All experiments, after approval by the dedicated committee (SPSC or INTC, and Research Board), are quite unique in the world. The facilities at CERN (SPS, PS, ISOLDE, nTOF, AD) support the requirements of substantial communities and provide unique conditions for numerous experiments.
Organisation	Each experiment or facility has a specific organisation, similar for all collaborations. Each is controlled by a specific MoU.
Risks	The total number of protons which can be delivered to the experiments is lower by design of the accelerator chain than expected by the experiments.
2010 targets	Meet the goals set by the Research Board.
Future prospects	**AD:** New programme for the study of interaction of anti-matter with gravity (AD-6), adding a cooling ring (ELENA) to the anti-protons beam. **ISOLDE**: in the context of the HIE-ISOLDE project, further increase of REX energy. Installation of spectrometer at REX. Upgrade of the target area to meet LINAC4 intensities. **n-TOF**: The construction of a second experimental area (EAR-2) at 20m from the spallation target has been proposed and will give unprecedented beam intensities and characteristics. Implementation of the outcome of the non-LHC diversity workshops in 2009.
Specific Health and Safety issues	**ISOLDE**: Some experiments involve handling of open radioactive sources. For these cases individual training by RP is done. **n-TOF**: Safety issues related to the use of radioactive sample material for measurements, in particular for actinides; these have been cleared by CERN safety authorities. **AD**: Safety issues related to the use of radioactive sources; these have been cleared by CERN safety authorities.
Outreach	Launched diversity workshops for fixed target experiments and neutrino physics in 2009.
CERN contribution	General support in line with the General Conditions applicable to experiments performed at CERN.
CERN budget for 2010	Personnel: 3.3 MCHF, Materials: 4.8 MCHF.

Note that information on the ISOLDE and n-TOF facilities, as operated by the BE Department, is not included in the above.

9. Scientific Support

9.a Theory

Goal	Participate in the analysis of data generated by the LHC and other experiments at CERN. Provide high quality theoretical research and a general service to the Theory Community.
Running conditions	General scientific support and logistics for Theory Research. The part on running conditions for the experimental data acquisitions does not apply to the TH mandate.
Competitiveness	Maximal sharing is encouraged. We also continue to be one of the top 5 theory groups in the world.
Organisation	Group PH-TH.
2010 targets	Support experiments and TH community.
Future prospects	Support experiments and TH community. Help and support initial analysis of LHC data. We are running the TH Theory Institute programs with world-wide participation not only in the study of BSM prospects, but also Top Physics at the LHC and Astroparticle implications.
Longer term	Theoretical excellence, and in depth analysis of the prospects provided by full data exploitation of the LHC. In 2010 we have already some TH-Institute programs being proposed. Among them to have a meeting of world experts and local ones on radiative correction tools in order to better understand event generators and reconstruction, as well as recognition of backgrounds. CERN is also dedicated to get funding for Theoretical Astroparticle Physics activities which have direct connection with the LHC. This includes the prospect of hosting a particle/astroparticle theoretical physics institute.
Outreach	The PH-TH group participates actively and systematically in the Organizations outreach activities in the form of public lectures in the member states and whenever required by the visits on-site. Studies concerning scientific risk and discovery potential.
CERN contribution	Logistics and general support. Budget for TH visitors has been restructured in a more efficient way to run the TH-Institute in terms of focussed programs most of which are related to LHC data and prospects.
CERN budget for 2010	Personnel: 9.8 MCHF; Materials: 1.8 MCHF.

9.b Physics analysis centre

Goal	Capacity to analyse at CERN the physics data produced by experiments hosted by CERN for all scientists involved.
Approval	Since the first experiment run / additional manpower in June 2007.
Start date	2009 initiative for the analysis centre, extra manpower included since 2006 as part of new initiatives, general physics data handling.
Competitiveness	CERN's analysis centre has to be competitive with the anlysis centres world wide being part of the LCG.
Risks	Without investing in physics data handling, the data taking would be compromised; providing an analysis centre is crucial for the host lab of the LHC collaborations. Relevance of CERN teams in collaborations for which CERN is the Host Lab.
2010 targets	Providing the manpower needed to create the Physics Analysis Centre / starting works for creating the workspace for the analysis centre.
CERN budget for 2010	Personnel 3.7 MCHF, Materials 2.1 MCHF.

9.c Scientific Computing and Technical Support

Goal	Support to the various experiments at CERN on: Scientific computing tools, detectors mechanics and electronics development, design, construction, installation and maintenance (including associated services) and provision of administrative and logistics service to the community of users.
Running conditions	General scientific computing, technical, logistics and administrative support for experiments. The engineering (DT) and electronics (ESE) groups are involved in the operation of the experiments and provide on call services. The resources are shared between operation and new initiatives, the sharing being adapted to the requests for operation and shut-down periods.
Competitiveness	The resources are used on a multi-projects basis focusing mainly on common activities for all experiments.
Organisation	Groups of PH involved: AGS, DT, ESE and SFT. Steering boards involving representatives from experiments and PH management periodically review the current activities, agree on new common or specific activities, and define the priorities.
Risks	No Financial, technical or managerial risks identified, provided that the level of resources are kept at least at the present level to preserve expertise and to provide support to the community of users.
2010 targets	Assure a safe, efficient and reliable operation of the experiments. Provide support to the community of users.
Future prospects	Support operation, consolidation for running experiments. Support new initiatives and upgrade activities. Consolidate computing tools for the analysis of LHC data.
Longer term	Involvement in R&D activities for LHC upgrades and Linear Collider detectors.
Outreach	Publication and regular updating of activities on Web sites. The expertise developed in the support groups is regularly consulted by external institutes (computing, detector technologies and electronics). Participation to R&D collaborations and KTT activities.
CERN contribution	Administrative, logistics, computing, technical and general support.
CERN budget for 2010	Personnel: 35.1 MCHF; Materials: 7.9 MCHF.

10. Low and medium accelerators / PS and SPS complexes / Accelerator technical services

Goal	The accelerators and areas heading comprises the non-LHC accelerators forming the CERN complex. Included are Linac2, PSB, PS, AD and SPS. These machines provide a range of beams to several experimental facilities including ISOLDE, the PS fixed targets, n-ToF, AD, the SPS fixed targets and CNGS. Linac2, PS Booster, PS and SPS also form the main injector chain for the LHC. Concerning the low and medium energy accelerators the consolidation of n-Tof will be completed in 2009 and the facility put back into operation. Additional funds to allow a possible extension of AD running beyond the end of 2010 have also been approved. Concerning the SPS, the first data-taking run of CNGS has been completed after the modification needed to reduce the impact of radiation on the installed electronics. The goal is now to deliver high intensities to CNGS each year. In order to reduce losses a new extraction and transfer system has been built in the PS. Initial commissioning is complete and the system will be put into full operation during 2009. The initial urgent consolidation of the complex is well underway, but more consolidation will be required from 2012 onwards in order to keep the machines working at optimum performance until the proposed new LHC injector chain can be put into operation. The heading also includes accelerator technical services, generic expenditure for accelerator engineering, controls and operation.
Approval	A new experiment for AD (AEGIS) is in the process of approval and is planned to start data taking during 2011.
Running conditions	The number of facilities, together with the diversity of beams to be delivered, means that there is an overall shortage of protons available. Very dynamic optimization of the operational machine cycles is needed to maximize the availability of beam to all experiments. A prioritization between the different facilities will be needed and is under discussion between the management and the relevant scientific committees.
Competitiveness	The CERN accelerator complex represents a unique facility over a range of particle energies. During 2009 there will be a Diversity Workshop at CERN in order to identify possible new, non-LHC experiments.
Organisation	Specific organization of each facility with CERN in charge of technical operation. Overall organization under the Directorate for Accelerators and Technology.
Risks	Specific risks have been identified and mitigation measures are underway. **Failure of the PS motor generator set:** A new PS power supply is under construction and will be put into service at the end of the first LHC run. In parallel, an emergency solution with reduced efficiency was developed by which the PS could be powered directly from the 18kV supply to fill the LHC. **Failures in Linac2:** A consolidation of the RF tanks in Linac2 has already been undertaken to reduce the risk of a vacuum failure. A study to address the possible failure of a magnet in the drift tubes is underway. **Radiation in target areas,** especially in CNGS has a risk for the performance of the installed equipment. **The spares situation** has been studied. In certain critical areas insufficient spares presently exist in case of failure (e.g. CNGS Horn and reflector). The total number of protons which can be delivered to the experiments is lower by design of the accelerator chain than expected by the experiments.
2010 targets	Delivery of beams to all users with the maximum overall efficiency. All of the non-LHC physics programmes are done in parallel with operation for LHC injection. The total beam to each user will be limited by the overall scarcity of protons. For CNGS the target is to deliver the maximum possible protons, but this is likely to be less than the $4.5 \times 10^{+19}$ per year which has been requested.
Future prospects	Preparation for the new AEGIS experiment on the AD will begin in 2010 for first beam in 2011. Continued studies to further enhance the beams for all users.
Longer term	LINAC4 will provide an increase in beam intensity and brightness. An intensity and energy upgrade is under consideration for ISOLDE (HIE-ISOLDE). AD is considering a new post decelerator (ELENA) to increase the intensity and brilliance of the anti-protons delivered to the users.
Specific Health and Safety issues	Losses throughout the accelerator complex produce some activated equipment. Sites are identified for the treatment and storage of this equipment. Budget must be set aside to deal with the disposal of the radioactive waste, especially the treatment of the used ISOLDE targets. RP surveys all such operation.
CERN budget for 2010	Low and medium accelerators: Personnel: 5.3 MCHF, Materials: 3.0 MCHF; PS and SPS complexes: Personnel: 30.9 MCHF, Materials: 19.6 MCHF; Accelerator technical services: Personnel: 28.0 MCHF, Materials: 9.6 MCHF.

Infrastructure and Services

11. Infrastructure

11.a Manufacturing facilities

Goal	Provide specific engineering solutions combining mechanical design, production facilities and material sciences. Prototyping and feasibility developments. Design and manufacture of high complexity PCBs where the production time and cost in industry would be to long/high.
Start date	Big re-organisation where the projects started paying for the services provided: 1992.
Running conditions	Projects at CERN pay for the development and production.
Competitiveness	Projects at CERN not obliged to pass by the workshops so in real competition with the private industry.
Organisation	Mechanical design and production in the group EN-MME. Design and production of PCB is a section with the group EN-ICE. Both managed by the Engineering Department under the Directorate for Accelerators and Technology.
Risks	Production may be on the critical path of the projects, which puts enormous focus on priorities and resources.
2010 targets	Avoid any delays in projects where the design/production is on the critical path.
Future prospects	Keep the know-how of mechanical construction of beam accelerators and physics detectors and PCBs within CERN. Let the outside industry produce the "standard components".
Longer term	Establish long-term refurbishing of the tools.
Specific Health and Safety issues	Comply with the international standards of safety. A study is under way to improve the long-term working conditions in the workshops.
Outreach	Collaborating with outside industry. Development at CERN, production of standardized products outside.
CERN budget for 2010	Personnel: 16.8 MCHF, Materials: 2.1 MCHF.

11.b General facilities and logistics

Activities	This consists of technical infrastructure (i.e. cooling and ventilation, electrical distribution, heavy handling); site facility management (cleaning, guards, green areas, site management, registration services); and logistics (i.e. stores, shipping, goods reception and mail services). The materials cover essentially industrial service supplies and maintenance contracts. This heading is a stable baseload over time.
Risks	The functioning is more and more compromised by the urgent need for consolidation of both, technical and general infrastructure(see fact sheet 21) at the end of their lifetime. Some examples of the ageing infrastructure are pipes to be urgently replaced, roof repairs and buildings surfaces.
CERN budget for 2010	Personnel: 21.8 MCHF, Materials: 35.7 MCHF (of which 15.5 MCHF are technical infrastructure, 18.8 MCHF are for site facility management and 1.4 MCHF are for logistics).

11.c Informatics

Activities	Informatics includes the computing infrastructure, desktop services, OpenLab (funded by external revenues), and scientific information services. LHC Computing is outlined in a separate, dedicated factsheet.
Risks	Some external funding is secured on short-notice, consolidation and upgrading of the network infrastructure as well as the communication system becomes more and more urgent.
CERN budget for 2010	Personnel: 23.5 MCHF, Materials: 16.5 MCHF.

12 Safety, health and environment

Activities	Generic safety, environment expenditure and services: Fire brigade (53 fire fighters), medical service (two doctors, three nurses), generic safety and radioactive waste management, expenditure for safety in the various programmes is charged against these. Operational Radiation protection incl. dosimeters. LHC Safety improvements following Sept. 19th (recommendations Safety taskforce). LHC Safety consolidation. Safety issues related to the required infrastructure consolidation are allocated there (see fact sheet 21a and b) as well as safety equipment consolidation Asbestos monitoring, safety training, technical inspections.
Targets for 2010	Safe operation of LHC and all other facilities [ALARA as low as reasonable achievable principle for radiation protection]. Long term safe operation of the LHC as cryogenic machine. Implement Chamonix 2009 recommendations to improve safety of LHC-operation. Consolidation.
Risks	Legal Non-Conformities, general health & environment, impact on Public Relation. Safety of personnel; environmental protection; safety of equipment and installation.
CERN budget for 2010	Personnel: 19.0 MCHF, Materials: 7.5 MCHF (out of which radioactive waste management amounts to 3.8 MCHF).

13 Administration

Activity	Generic expenditure of the Director General office and dedicated services, human resources management, financial services and purchasing. It also includes the expenditure related to Council and its committees.
Goal	Improve administrative processes to fulfill the needs, transparent, service oriented and high quality whilst limiting the total P+M cost not to exceed the current level with respect to total expenditure.
2010 targets	Balance central/non-central administration, final implementation of KPIs, review in-house versus outsourcing of various processes in the central administration.
CERN budget for 2010	Personnel 30.9 MCHF; Materials 8.1 MCHF.

14 Outreach & Scientific exchanges and Knowledge & Technology Transfer

14.a Outreach and Scientific Exchanges

Goal / activities	To promote the public understanding of particle physics, cosmology, and related technologies through activities such as the visits, teachers and exhibition programme. To foster the engagement of CERN with society and key target audiences through a range of activities on and near to the CERN sites and through European countries. To foster support for CERN and its missions. CERN Teacher Programmes (between 3 days and and 3 weeks): to update the knowledge and to enthuse school teachers, so that they can better motivate their students to continue their scientific studies at secondary level; to raise more interest and inspire young people to continue their scientific studies at secondary level; to make school teachers ambassadors for CERN. Visits and exhibitions: to inform the outside world about the science that is done at CERN by providing the opportunity to visit the laboratory, meet working scientists, and visit experimental facilities, aiming to double the number of currently 20,000 visits per year.
CERN budget for 2010	Personnel: 6.1 MCHF, Materials: 7.8 MCHF.

14.b Knowledge and Technology Transfer

Goal	To maximize dissemination in Member States of CERN technologies and know-how. To demonstrate that, through KTT activities, CERN is making a positive and durable impact on global and societal issues. To foster a worldwide network of people and institutions wishing to cooperate with CERN including an alumni programme.
Activities	Identification, protection and dissemination of CERN's Intellectual Property. Networking activities both in-house and globally, aiming to raise awareness of the role of the KTT office and, more generally, of CERN KTT opportunities.
Risks	Definition of Intellectual Properties. Dealing in a transparent way with conflicts of interests and unequal treatment of partners.
CERN budget for 2010	Personnel: 1.7 MCHF, Materials: 1.8 MCHF.

15 Centralised expenses, budget balances and capital repayment

Centralised Personnel Expenses, which are expenses related to previous and future staff such as the CERN share for pensioners health insurance, pre-retirement of shift workers, arrival and departure entitlements and unemployment benefits (31.1MCHF in 2010); please note as well the heading of 17 MCHF under other expenses to amortize over 10 years the provision for acccruals of staff's paid leaves and shift worker compensation.
Internal taxation related to the amount of basic salaries of CERN personnel (24.0 MCHF estimate for 2010).
Personnel on detachment is linked to staff working in other organisations for which CERN receives the costs as revenues, the heading is assumed to stay similar over time, around 0.7 MCHF.
Energy and water This heading includes the additional provision for the winter run in 2009/2010 of some 13 MCHF arriving at a total of 77.2 MCHF for 2010.
Central insurance and postal **charges** of 7.0 MCHF for 2010.
Interests and financial costs inludes the interests for the FORTIS bank loan and short-term loans as well as bank charges. The reduction is linked to the completed EIB loan repayment in April 2009 and reducing short-term loans. The 2010 estimate amounts to 16.7 MCHF.
The annual balance of the budget is used for capital repayment according to the schedule agreed with FIPOI, the EIB and FORTIS banks and as a function of the cash position to minimize the short-term loans.

Projects

16 Linear Collider

16.a CLIC

Goal	Design of a e+/e- multi-TeV Linear Collider based on a novel Two Beam Accelerator scheme and address all feasibility issues documented in a CLIC Conceptual Design Report (CDR) by end 2010. A test facility (CTF3) is built and run by a multi-lateral collaboration of 27 institutes providing additional (M&P) resources. If approved by the Council in 2011, a Technical Design could be launched with spending starting early 2012. Develop a close collaboration with the International Linear Collider (ILC) based on RF Superconducting Structures for a LC in the TeV energy range aiming at: - an optimum use of resources, - developing by the CLIC and the ILC teams a set of complementary Linear Collider technologies in preparation for the next HEP facility best adapted to the favoured Physics scenario based on LHC physics results as soon as they will become available, - fostering a common Linear Collider Community.
Approval	Accelerated CLIC R&D by CERN Council in 2004
Start date	July 2004, Rome
Costs	Total from 2004 to 2010: 112.1 MCHF. Spent from 2004 to 2007 = 56 MCHF (24.9 MCHF Materials + 31.1 MCHF Personnel). Foreseen spending from 2008 to 2010 = 56.1 MCHF (27 MCHF Materials + 29.1 MCHF Personnel).
Running conditions	CLIC/CTF3 Collaboration of 27 Institutes from 15 countries organised like a physics experiment with members represented in a Collaboration Board and by a Spokesperson. The contribution of each member is described in a specific MoU addendum with a total external contribution of 15 MCHF and 107 FTE.
Competitiveness	Collaborative competition with the International Linear Collider (ILC) based on RF Superconducting Structures for a LC in the TeV energy range. CLIC design complementary to ILC by extending LC into the multi-TeV energy range. A constructive collaboration between CLIC and ILC has been launched with 7 common working groups on subjects with strong synergies between the two studies. This collaboration is evolving towards developing common strategy and synchronised scenarios concerning Linear Colliders.
Organisation	CLIC nucleus study team hosted at CERN and reporting to the CLIC/CTF3 Collaboration Board with representatives of all collaborating institutes. Distribution and follow-up of work packages by the CLIC Steering Committee to CERN groups and external collaborators. Overall organization under the Directorate for Accelerators and Technology.
Risks	Failure to address all CLIC technical issues by 2010.
2010 targets	Complete CLIC Test Facility (CTF3) installation to address major CLIC technical issues and demonstrate performances of accelerating structures with nominal parameters (100 MV/m at 10-7 breakdown rate). Complete Conceptual Design of a 3 TeV Linear Collider in stages by end 2010.
Future prospects	Technical Design by mid 2016 pending approval by the Council in 2011.
Longer term	Possible construction of a Multi-TeV Linear Collider based on CLIC technology from 2017 onwards.
Specific Health and Safety issues	High beam power and radiation issues.
CERN contribution	Overall coordination of the overall CLIC study and CTF3 project. Host of the CLIC/CTF3 Collaboration. Validation, distribution and follow-up of the work-packages. Contribution to the ILC design through the CLIC/ILC collaboration.
CERN budget for 2010	Personnel: 12.2 MCHF, Materials: 10.0 MCHF.

16.b Linear Collider Detector R&D

Goal	Physics and detector studies for a future e+e- linear collider up to 3 TeV (CLIC or ILC) in a world-wide collaboration.
Approval	Preparatory studies, no formal approval by a scientific committee yet.
Start date	January 1st 2009
Costs	Approx. 2 MCHF (P+M) in 2009. Future costing is in preparation.
Running conditions	Preparatory studies, not a running experiment.
Competitiveness	In collaboration with world-wide linear collider physics/detector studies.
Organisation	CERN
Risks	Not yet applicable.
2010 targets	Simulation studies in preparation of the CLIC conceptual design report due for end 2010. Setting-up of a targeted hardware R&D program.
Future prospects	Physics/detector part of the CLIC conceptual design report at the end of 2010, and of the technical design report towards the end of 2015.
Longer term	Participation in the construction of 1 or 2 experiments at a future e+e- linear collider.
Specific Health and Safety issues	None for the moment.
Outreach	http://lcd.web.cern.ch/LCD/.
CERN contribution	In 2009: simulation studies and participation in the EUDET (EU FP6) project.
CERN budget for 2010	Personnel: 1.5 MCHF, Materials: 0.6 MCHF, including EUDET participation.

17 LINAC 4

Goal	Build a 160 MeV H- linear accelerator to inject particles into the PS Booster and later on into a renewed injector chain.
Approval	CERN Council June 2007
Start date	January 2008
Costs	99.8 MCHF (material), 182.3 FTE (personnel).
Running conditions	Project funded partly by the White Paper (55 MCHF, 100 FTE) and partly by CERN funds (Civil Engineering and machine installation). Expected contributions from Non-Member states and external organisations at the level of 3 – 5 MCHF. In-kind contribution from France (special White Paper contribution) of 1.75 MEUR and 3 FTE.
Competitiveness	No competition with other projects.
Organisation	Project composed of 218 Work Units distributed into 30 Work Packages assigned to CERN Groups. Management by Project manager supported by 6 sub-managers and a Technical Coordinator. Progress of Work Units controlled via an EVM tool. Project baseline frozen in March 2009. Overall organization under the Directorate for Accelerators and Technology.
Risks	Technical: some accelerator components are of novel design and require prototyping. In case of the failure of prototypes, alternative solutions exist but could lead to delay in the schedule. Financial: uncertainties on the cost of large contracts with industry (corresponding to 10-15% of the budget), which depend on fluctuations of exchange rates, on the price of commodities and on commercial strategies. Schedule: tight commissioning schedule in 2013, unexpected problems could delay the PSB start-up.
2010 targets	Complete civil engineering, launch construction of all accelerating structures and main components, place the orders for the RF hardware, and commission the RFQ.
Future prospects	Injection in the main accelerator chain (PSB-PS-SPS) from 2014, injection into the new accelerator chain (SPL-PS2) from 2020.
Longer term	Possibility to upgrade to high beam power if required by future physics programmes.
Specific Health and Safety issues	Standard health and safety issues for accelerators.
CERN contribution	Project fully controlled by CERN, integrating in-kind contributions from Member and Non-member States.
CERN budget for 2010	Personnel: 6.5 MCHF, Materials: 26.6 MCHF.

18 LHC Focus Quadrupoles (NbTi) upgrade

Goal	The goal of the "LHC IR Upgrade – Phase-1" project is to increase focusing of the beams in the ATLAS and CMS interaction regions and enable reliable operation of the LHC at the luminosity of 2 to 3 10^{34} $cm^{-2}s^{-1}$. The scope of the project is to: - Replace the present triplets with 120 mm aperture quadrupoles based on the existing LHC dipole cables cooled at 1.9 K. - Replace the D1 dipoles, TAS and other beamline equipment. - Upgrade the powering and protection equipment for the triplets and D1. - Modify the matching sections in IR1 and IR5 to improve optics flexibility and machine protection. - Upgrade the overall LHC optics. - C11 The interfaces between the LHC and ATLAS and CMS remain unchanged. The existing cryogenic and other infrastructure remains unchanged and will be used to the full potential.
Approval	Approved by CERN Council in June 2007 as part of the "New Initiatives" in the period 2008-2011.
Start date	January 2008
Costs	The estimated cost of the project for CERN is 42.3 MCHF (materials) and 110 FTE. A special French contribution at the level of 4.2 MCHF and a contribution from the US at the level of 25 MUSD have been formalised.
Running conditions	The new ATLAS and CMS interaction regions will use to the utmost the cryogenic capacity presently available in IR1 and IR5, which will ultimately determine the luminosity after the Phase-1 upgrade.
Competitiveness	The project resolves one of the major bottlenecks on the road to higher LHC luminosities.
Organisation	The Project involves teams from several CERN Departments (TE, BE, EN). Teams from European laboratories (CEA, CNRS, CIEMAT and STFC-RAL) are collaborating in the design of various magnets as part of the SLHC-PP project. Collaboration with Fermilab and BNL has been agreed as part of the US-APUL project. Overall organization under the Directorate for Accelerators and Technology.
Risks	The project relies on the use of the main magnet components (superconducting cable and special steels) and tooling, which are available from the production of the LHC main dipoles. As such, the risks related to procurement are reduced. The available resources at CERN for the Phase-1 upgrade are subject to the priority of bringing the LHC into operation.
2010 targets	The main targets for 2010 are: - Completion of the Technical Design Report. - Start of construction of the model magnets.
Future prospects	Completion of the pre-series low-β quadrupole is foreseen in 2010. The series production of the magnets and other equipment is planned in 2011-13. A string test is planned in 2013, with the purpose of completing a full system test before installation in the tunnel, foreseen in 2014.
Longer term	As a first step in the upgrade of the LHC, the Phase-1 upgrade will be followed by Phase-2 with the goal of further increasing the LHC luminosity; Phase-2 is presently expected around 2018.
Specific Health and Safety issues	The design of the new equipment will take into account all consequences of the radiation levels present in the LHC when operating at high luminosities on installation, operation, maintenance and disposal of equipment.
CERN contribution	CERN contributes to the project in a major way by leading the design effort, organising and steering the collaborations, and organising the production and testing of the low-beta quadrupoles and other equipment.
CERN budget for 2010	Personnel: 1.1 MCHF, Materials: 9.7 MCHF.

19 R&D activities

19.a R&D accelerators

Goal	Prepare for May 2012 detailed Conceptual Design Reports and cost estimates for LP (low power)-SPL, PS2, SPS upgrade, and phase 2 of the LHC collimation and IRs upgrade to allow for a Council decision to start phase 2 of the LHC upgrade in 2013.
Approval	Approved by the CERN Council in June 2007 as part of the "New Initiatives".
Start date	January 2008
Costs	161 man.years + 25 MCHF
Running conditions	R & D partly integrated in EU Programmes ("SLHC" CNI-PP and EuCARD IA) in partnership with other European laboratories. Direct contributions from USLARP and from multiple collaborations.
Competitiveness	To reach the goal of the LHC upgrade phase 2 (an order of magnitude increase above nominal of the daily integrated luminosity in LHC), the ageing injector chain must be renewed and the LHC collimators, IRs and detectors need major improvements.
Organisation	sLHC nucleus team with project leaders managing contributions from most CERN departments and external laboratories in Europe, Canada and USA. Overall organization under the Directorate for Accelerators and Technology.
Risks	Technical and financial: quality and completeness of the R&D until 2012 will directly impact the sLHC design and cost estimates.
2010 targets	Construction & test of prototypes of components. Detailed design of subsystems.
Future prospects	Start of construction in 2013 if approved by the CERN Council in 2012.
Longer term	Possibility to upgrade to high beam power at medium energy if required by future physics programmes (e.g. for a neutrino facility or for a Radioactive Ion Beam facility).
Specific Health and Safety issues	Safety will be covered in the detailed CDRs to be published in 2012.
CERN contribution	155 FTEs + 24.6 MCHF over the period 2008-2012.
CERN budget for 2010	Personnel: 4.2 MCHF, Materials: 3.0 MCHF.

19.b R&D computing supported by EU

Activities	EU support Computing R&D (mainly EGEE 3 until April 2010, extension without additional funding under review, other projects are ETICS-II, BalticGrid-II, SEE-GRID SCI, GridTalk, EGI_DS, Health e-child, D4Science).
Goals	Enhance Grid technology in Europe.
CERN budget for 2010	Personnel: 2.0 MCHF; Materials: 0.3 MCHF.

19.c R&D for LHC detectors upgrade

Activities	Investigate trigger, data acquisition and radiation hard electronics for detectors, general development of detector components, coordination through CERN of a European programme (SLHC-PP).
Goals	Prepare for a LHC luminosity upgrade in line with the LHC machine upgrade schedule.
CERN budget for 2010	Personnel: 0.7 MCHF; Materials: 0.2 MCHF.

19.d Other R&D

Activities	Seed funding to match CERN contribution for Theme 4 R&D such as neutrino facility, HIE Isolde, etc. To be decided after the diversification workshops in October.
Goals	To be determined if collaborations are formed.
CERN budget for 2010	Personnel: 0.4 MCHF ; Materials: 1.6 MCHF.

20 Construction of SPL, PS2 and SLHC

Goal	Renewal of the LHC injectors (replacement of PSB + PS by SPL + PS2, SPS upgrade) to meet the performance goals of the LHC upgrade phase 2. Upgrade of collimation, IRs and detectors in LHC.
Approval	2012
Start date	January 2013
Costs	Under analysis: estimates will be provided in 2012. Contributions from non-member states are considered.
Running conditions	To be defined.
Competitiveness	LHC is a unique physics instrument of its class in the world. These projects will allow to use its full potential, making use of the knowledge gained running the LHC as-built, and of the latest technological developments.
Organisation	SPL, PS2, collimation upgrade, new IRs and detectors improvements will be run as independent projects coordinated inside CERN. Overall organization under the Directorate for Accelerators and Technology.
Risks	Achieving the delivery of the conceptional design reports in the given timeframe with limited manpower available.
Longer term	Possibility to upgrade to high beam power at medium energy if required by future physics programmes (e.g. for a neutrino facility or for a Radioactive Ion Beam facility).
CERN budget for 2010	Personnel: 0 MCHF, Materials: 1.0 MCHF. The 2010 expenses are the preparatory expenses for the infrastructure works. The real project costs will start from 2012 onwards only pending the outcome of the studies and the Council decision.

21 Consolidation

21.a LHC and Accelerator consolidation

Goal	The overall aim is to align CERN's infrastructure to common standards and best practice after decades of insufficient investments in the accelerator, technical and general infrastructure. - Consolidate CERN's accelerator complexes to ensure reliable LHC operation, - Replace infrastructure at the end of its lifetime (like office buildings), - Enhance infrastructure to serve CERN's increasing community (user office space, restaurants, Cafeteria).
Approval	2005 and 2008; 2007 new initiatives.
Running conditions	This activity consists of many multi-annual projects. Thus the quantum is a sub-project, not the yearly budget.
Competitiveness	Without increasing investments in CERN's accelerator, technical and general infrastructure, the operation of the scientific programme is endangered. Renovating the general infrastructure is necessary to reduce operation and maintenance costs (heating, lightning, etc).
Organisation	For a detailed listing of the individual work units budgets, etc., concerning the Accelerator Consolidation see: http://en-dep.web.cern.ch/en-dep/Groups/MEF/Consolidation/Accelerator_Consolidation.htm. The list of infrastructure items covers major repairs and required refurbishments of buildings, roads and other general infrastructure, cooling and ventilation, electrical distribution, computing network, etc.
Risks	Since the LHC approval, CERN has operated in a repair mode instead of preventive maintenance. This has resulted in a backlog of outstanding investments for infrastructure items at the end of their lifetime. Without renovation of the accelerator infrastructure and equipment, LHC operation will be severely compromised.
2010 targets	Continuation of additional accelerator consolidation to ensure reliable LHC operation (In particular in 2009 major work will start on PS access control system and the SPS 18kV substations).
Future prospects	This MTP includes continuing funding for accelerator and LHC consolidation to be able to address upcoming consolidation projects (e.g. completion of the PS control access system, LHC cooling and ventilation system).
Longer term	In addition to accelerator infrastructure, the technical and general infrastructure requires major repair and replacement including possibly the replacement of older buildings.
Specific Health and Safety issues	CERN infrastructure has to be upgraded so as to become more energy-efficient. More reliable equipment reduces the interventions needed in radioactive areas.
CERN budget for 2010	Accelerator consolidation: Personnel 2.6 MCHF, Materials: 5.0 MCHF. LHC consolidation: Personnel: 4.7 MCHF, Materials: 12.3 MCHF.

21.b General Infrastructure consolidation

Goal	With general infrastructure is understood machine, experimental and tertiary buildings, caverns and tunnels. Machine specific infrastructure such as electrical power distribution and cooling systems are not included. Over the years since the LHC project approval the maintenance of this infrastructure has been kept to a strict and bare minimum. Only vital repairs have been executed. During the next few years a major consolidation program will be executed to permit the organization to face the challenges that the LHC operation in terms of site usage will bring. In addition the evolution of sustainable development and responsible energy usage in tertiary applications i.e. heating/air conditioning etc. will have to be taken into account as society evolves.
Running conditions	This activity consists of both large scale multi year projects and multiple short projects.
Risks	Not pursuing the infrastructure consolidation implies serious risks for both the functioning of the accelerators and working conditions for the staff. Carbonation starts attacking the stability of buildings (notably building 30). Restaurant 3 will have to be close for hygiene reasons.
2010 targets	Refurbishment of accelerator related buildings and office buildings threatened by concrete carbonisation; start of restaurant 1 extension project and restaurant 3 total renewal project. The global consoldiation project is split over at least 10 years and will then have to be maintained at a consistent level to avoid further deterioration. Additional office buildings are also planned to be able to host an increasing number of users.
Future prospects	Refurbishment of accelerator related buildings and office buildings threatened by concrete carbonisation; start of restaurant 1 extension project and restaurant 3 total renewal project. Pending external income, new auditorium and user building. Some additional funds for computing infrastructure refurbishments and renewals.
Specific Health and Safety issues	As in the 1950s and 1960s many buildings on the sites were constructed using asbestos technology, their future refurbishment or demolition will entail major costs.
CERN budget for 2010	Personnel 1.1 MCHF, Materials: 27.7 MCHF.

III. Resources Plan for the years 2010 to 2014

1. Revenues plan

Table 1: Anticipated revenues in 2009 prices

(in MCHF, 2009 prices, rounded off)	2009 Revised budget	2010	2011	2012	2013	2014	Total 2010-2014
Revenues	**1 185.9**	**1 189.9**	**1 207.7**	**1 169.0**	**1 146.9**	**1 145.4**	**5 858.9**
Member States' contributions	1 098.6	1 099.4	1 099.4	1 099.4	1 099.4	1 099.4	5 497.2
Additional contribution from Host States	22.3	22.4	25.3				47.7
EU contributions	18.6	12.1	7.0	3.6	1.5		24.2
Personnel paid on team accounts	9.9	9.9	9.9	9.9	9.9	9.9	49.7
Personnel on detachment	0.7	0.7	0.7	0.7	0.7	0.7	3.6
Internal taxation	24.0	24.0	24.0	24.0	24.0	24.0	120.1
Knowledge and technology transfer	1.6	2.5	2.5	2.5	2.5	2.5	12.5
External revenues for new amphitheatre		10.0	30.0	20.0			60.0
Other revenues	10.1	8.8	8.8	8.8	8.8	8.8	43.9
Sales and miscellaneous	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	*10.0*
Openlab revenue	*1.4*						
Financial revenue	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*1.0*
Housing Fund	*6.6*	*6.6*	*6.6*	*6.6*	*6.6*	*6.6*	*32.9*

The overview of the various revenues headings is shown in Table 1 in constant 2009 prices. There are essentially no variations with respect to last year's assumed revenues.

In order to be able to master the challenge of reliable LHC operation, it has been assumed that the contributions from the Member States will remain constant after 2011 except for the special Host States' contributions which are due to end in 2011.

As agreed by the Council, Greece will pay 100% of its contribution due from 2010 onwards.

Please note that the revenues plan (like the expenses estimates) only includes the EU contributions of approved projects until April 2009. CERN will continue to make proposals aiming for continuous support from EU funding for both training programmes and scientific projects.

Knowledge and Technology transfer is expected to attain a higher level of revenue than in 2008 and therefore return to the level achieved in 2007. The housing fund revenues have been included in the CERN accounts since the implementation of IPSAS.

2. Resources allocations and expenses

Table 2: Scientific programme – LHC

Fact Sheet	(in MCHF, 2009 prices, rounded off)	2009 Revised budget	2010	2011	2012	2013	2014	2010-2014 Total
	LHC programme (incl. projects)	**264.0**	**280.8**	**292.5**	**279.5**	**268.7**	**268.1**	**1 389.5**
1	**LHC machine and injectors**	**135.8**	**137.6**	**147.2**	**154.4**	**154.4**	**154.4**	**748.0**
	LHC machine and experimental areas	**106.4**	**125.4**	**124.7**	**127.0**	**127.0**	**127.0**	**631.1**
	Personnel	69.6	64.8	69.0	71.4	71.4	71.4	348.0
	Materials	36.8	60.6	55.7	55.6	55.6	55.6	283.2
	Sector 3-4 repair	**27.5**	**10.0**					**10.0**
	Materials	27.5	10.0					10.0
	Spares			**20.0**	**25.0**	**25.0**	**25.0**	**95.0**
	Materials			20.0	25.0	25.0	25.0	95.0
	LHC injectors (for heavy Ions)	**1.9**	**2.1**	**2.4**	**2.5**	**2.5**	**2.5**	**11.9**
	Personnel	1.4	1.6	1.9	1.9	1.9	1.9	9.1
	Materials	0.5	0.5	0.5	0.6	0.6	0.6	2.8
	LHC detectors	**92.4**	**87.6**	**80.0**	**79.8**	**79.1**	**78.6**	**405.0**
2	**ATLAS detector**	**26.9**	**25.2**	**25.7**	**25.7**	**25.5**	**25.3**	**127.4**
	Personnel	22.8	20.8	21.2	21.3	21.0	20.9	105.3
	Materials	4.1	4.5	4.4	4.4	4.4	4.4	22.2
3	**CMS detector**	**24.5**	**23.5**	**23.7**	**23.7**	**23.6**	**23.4**	**117.9**
	Personnel	20.7	20.0	20.3	20.3	20.2	20.0	100.9
	Materials	3.7	3.4	3.4	3.4	3.4	3.4	17.0
4	**ALICE detector**	**12.0**	**10.9**	**11.3**	**11.4**	**11.3**	**11.2**	**56.1**
	Personnel	9.6	8.6	9.0	9.1	9.0	9.0	44.7
	Materials	2.3	2.3	2.3	2.3	2.3	2.3	11.4
5	**LHCb detector**	**12.4**	**11.2**	**11.5**	**11.5**	**11.4**	**11.3**	**56.9**
	Personnel	9.8	9.2	9.5	9.5	9.4	9.3	46.9
	Materials	2.6	2.0	2.0	2.0	2.0	2.0	10.0
6	**Common items, other experiments (inc. Totem, LHCf)**	**9.5**	**7.5**	**7.8**	**7.5**	**7.3**	**7.3**	**37.3**
	Personnel	6.0	4.5	4.8	4.4	4.2	4.2	22.2
	Materials	3.5	3.0	3.0	3.1	3.1	3.1	15.2
	Detectors re-scoping	**7.2**	**9.4**					**9.4**
	Materials	7.2	9.4					9.4
7	**LHC computing**	**35.8**	**55.6**	**65.4**	**45.2**	**35.2**	**35.1**	**236.5**
	Personnel	16.7	17.7	17.5	17.3	17.2	17.2	86.9
	Materials	19.1	37.9	47.9	27.9	17.9	17.9	149.6
	% of total revenues	22.26%	23.60%	24.22%	23.91%	23.42%	23.40%	

Explanations to Table 2:

Table 2 shows the costs directly related to the LHC programme (end of construction in 2008 and luminosity runs from 2009 onwards). The costs of general services necessary to allow the operation of the scientific programme are shown in Table 4. This distinction into direct and indirect costs enhances transparency and allows benchmarking of the various headings.

For the **LHC machine**, the resources for exploitation are increased in 2010 and the following years based on the first experience of operation of the LHC's technical infrastructure without beam in 2008 and of operation of the LHC with first beams in September 2008. Furthermore, following the outcome of the LHC workshop in early 2009, a new LHC spare parts heading has been introduced to allow a fast recovery in the event of a future incident. The total P+M allocations for LHC machine operation, its injectors and spares inventory stabilise at around 4% of the capital investment per annum. Please note that this table includes neither the energy nor the operation costs of the PS and SPS complexes and accelerator technical services (both the LHC and its injector operation costs in P+M in Table 3 amount to about 8% of the capital investment per annum). The reduction of the personnel heading in 2010 is linked to the focus in 2009 on the LHC repairs and the spare parts initiative from 2011 onwards. Furthermore, the long run in 2010 reduces the manpower allocation during the shutdown.

The increased allocations for LHC machine operation and spares reflect the lessons learnt from initial operation in September 2008 and the LHC incident and are funded by delaying the outcome of the R&D studies for the new initiatives and projects as well as possible start of facilities to replace parts of the LHC injector chain (SPL, PS2) and the S-LHC (LHC luminosity upgrade).

With regard to the CERN share of contributions to **the LHC experiments**, the personnel strength reduces by some 14% from 2009 to 2011 following the commissioning period in 2009 to 2010 to free resources for LHC detector upgrades. The heading "Detector re-scoping" includes 24 MCHF in materials earmarked as the CERN contribution (at the level of 20%) to the Collaborations' plans for the final implementation of the LHC experiments (also known as re-scoping) from 2008 to 2011. These plans were discussed in the collaboration boards and were endorsed in the RRB meetings in autumn 2008.

With regard to **LHC computing**, the LHC Grid Phase 2 ended in 2008, and the LHC computing is ready for data-taking. From 2009 onwards LHC computing is referred to as Phase 3. The materials expenses essentially include CERN's share of the expenses on the required additional equipment, renewal of computer and data services, software development, licenses and a Computer Centre capacity increase. With respect to last year, the materials heading reduces by 6 MCHF per annum to allow for the funding of a new Computer Centre. However, the total resources to cover the cost of the new centre (estimated at 60 MCHF) will be needed in 2010 to 2012 (this will entail bringing forward some 24 MCHF from future years).

Table 3: Other Scientific Programmes

Fact Sheet	(in MCHF, 2009 prices, rounded off)	2009 Revised budget	2010	2011	2012	2013	2014	2010-2014 Total
	Other programmes	**164.1**	**164.8**	**162.5**	**159.4**	**157.1**	**156.0**	**799.8**
8	**Non-LHC physics**	**6.5**	**8.1**	**8.1**	**9.1**	**7.1**	**6.0**	**38.4**
	Personnel	3.5	3.3	3.8	3.9	3.8	3.8	18.6
	Materials	3.0	4.8	4.3	5.2	3.2	2.2	19.8
9.a	**Theory**	**12.0**	**11.6**	**11.2**	**11.2**	**11.0**	**11.0**	**55.9**
	Personnel	10.3	9.8	9.5	9.5	9.4	9.4	47.5
	Materials	1.7	1.8	1.7	1.7	1.6	1.6	8.4
9.b	**Physics analysis centre**	**6.1**	**5.8**	**3.3**	**0.5**	**0.5**	**0.5**	**10.7**
	Personnel	3.8	3.7	2.8				6.5
	Materials	2.3	2.1	0.5	0.5	0.5	0.5	4.2
9.c	**Scientific support**	**42.7**	**43.0**	**41.1**	**39.0**	**38.9**	**38.9**	**200.8**
	Personnel	31.4	35.1	33.1	31.1	30.9	30.9	161.1
	Materials	11.2	7.9	8.0	7.9	7.9	7.9	39.7
10	**Low and medium accelerators**	**8.0**	**8.2**	**7.9**	**9.4**	**9.4**	**9.4**	**44.4**
	Personnel	5.5	5.3	5.6	6.3	6.4	6.4	30.1
	Materials	2.5	3.0	2.3	3.0	3.0	3.0	14.4
10	**PS and SPS complexes**	**49.4**	**50.5**	**50.6**	**51.2**	**51.6**	**51.6**	**255.4**
	Personnel	31.8	30.9	31.5	31.2	31.6	31.6	156.8
	Materials	17.6	19.6	19.1	20.0	20.0	20.0	98.6
10	**Accelerator technical services**	**39.4**	**37.6**	**40.3**	**39.0**	**38.6**	**38.6**	**194.2**
	Personnel	26.8	28.0	30.9	29.6	29.2	29.2	147.0
	Materials	12.7	9.6	9.4	9.4	9.4	9.4	47.2
	% of total revenues	13.83%	13.85%	13.45%	13.64%	13.70%	13.62%	

Explanations to Table 3:

Non-LHC physics:

This heading (including the research allocation to AD, ISOLDE, COMPASS, CAST, NA62, etc.) is assumed to continue over time. Although a limited number of experiments has been approved for data-taking in 2010, the resources allocation earmarked for this programme is maintained to allow CERN to contribute its share for future extensions and new approved experiments as a function of the outcome of the upcoming Physics Diversity workshop.

Theory and Scientific Support:

The allocation maintains a stable workforce in line with the current personnel commitments and constant materials funding.

Physics Analysis Centre:

This heading includes the special manpower from the new initiatives for data analysis, which explains the reduction in 2012. Furthermore, the materials allocation includes provisions for setting up the Physics Analysis Centre.

Low- and medium-energy accelerators:

This heading comprises the AD, n-TOF and Isolde facilities and the allocations earmarked for their operation. The CERN Management intends to change the budgeting principle in 2010 to include not only the direct costs but also the indirect costs of the PS and SPS complexes as well as the accelerator technical services. This will significantly increase the amounts allocated to this heading without changing the total accelerator operation costs.

PS and SPS complexes / Accelerator technical services:

This constant heading includes all costs for the operation and technical groups linked to the complexes and will reduce with application of the new budgeting principle (i.e. when the respective shares of operation costs of the PS and SPS are allocated to the various facilities and to the LHC). The purpose of this new budgeting principle is to enhance transparency by reducing general headings and by allocating direct as well as indirect costs to the facilities and activities concerned (reduction of overheads).

The accelerator technical services are a further example of such a general heading. It essentially includes the costs of accelerator controls in P+M, travel costs, temporary work as well as the personnel costs for staff still on the payroll but using their saved leave or shift work compensation.

Table 4: Infrastructure, services and investments – indirect costs to the scientific programme

Fact Sheet	(in MCHF, 2009 prices, rounded off)	2009 Revised budget	2010	2011	2012	2013	2014	2010-2014 Total
	Infrastructure and services	**357.7**	**356.1**	**333.5**	**333.1**	**331.1**	**330.3**	**1 684.0**
11.a	**Manufacturing facilities**	**20.1**	**18.8**	**18.1**	**17.8**	**17.7**	**17.7**	**90.1**
	Personnel	17.8	16.8	16.2	16.0	16.0	16.0	80.9
	Materials	2.3	2.1	1.9	1.8	1.8	1.8	9.2
11.b	**General facilities and logistics**	**59.8**	**57.5**	**55.7**	**57.2**	**57.1**	**57.1**	**284.7**
	Personnel	23.4	21.8	22.4	23.0	22.9	22.9	112.9
	Materials	36.4	35.7	33.3	34.2	34.2	34.2	171.8
11.c	**Informatics**	**43.3**	**40.0**	**39.8**	**40.7**	**40.7**	**40.7**	**201.9**
	Personnel	25.2	23.5	22.9	23.7	23.7	23.7	117.6
	Materials	18.1	16.5	16.8	17.0	17.0	17.0	84.3
12	**Safety, health and environment**	**30.7**	**26.6**	**26.8**	**26.7**	**26.7**	**26.7**	**133.4**
	Personnel	21.3	19.0	19.3	19.1	19.2	19.2	95.7
	Materials	9.4	7.5	7.5	7.5	7.5	7.5	37.6
13	**Administration**	**37.4**	**39.0**	**37.2**	**35.8**	**35.0**	**34.9**	**182.0**
	Personnel	30.5	30.9	29.3	28.4	27.7	27.7	143.9
	Materials	6.9	8.1	8.0	7.4	7.3	7.3	38.1
14	**Outreach and KTT**	**17.4**	**17.5**	**16.3**	**15.9**	**15.9**	**15.9**	**81.5**
	Personnel	8.7	7.8	7.0	6.9	6.9	6.9	35.5
	Materials	8.7	9.6	9.2	9.0	9.0	9.0	46.0
15	**Centralised expenses**	**125.6**	**140.0**	**125.5**	**125.5**	**125.5**	**125.5**	**642.1**
	Centralised personnel expenses	**31.1**	**31.1**	**29.6**	**29.6**	**29.6**	**29.6**	**149.5**
	Internal taxation	**24.0**	**24.0**	**24.0**	**24.0**	**24.0**	**24.0**	**120.1**
	Personnel on detachment	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**3.6**
	Energy and water	**62.8**	**77.2**	**64.2**	**64.2**	**64.2**	**64.2**	**333.9**
	Insurances and postal charges	**7.0**	**7.0**	**7.0**	**7.0**	**7.0**	**7.0**	**35.0**
15	**Interests and financial costs**	**23.4**	**16.7**	**14.2**	**13.5**	**12.5**	**11.7**	**68.4**
	% of total revenues	30.16%	29.92%	27.62%	28.49%	28.87%	28.83%	

Explanations to Table 4:

Manufacturing facilities (engineering, the workshops and fabrication and engineering computing support). This heading remains almost constant over time on the assumption that the accelerator and experimental areas will need continuous support during the shutdowns. The higher materials allocation in 2009 is linked to the work on the LHC repairs.

General facilities and infrastructure includes site facility management and technical infrastructure (such as electrical distribution). The higher allocation in 2009 with respect to the constant allocations in future years is linked to additional transport requirements in 2009 for the LHC repair work.

Informatics covers IT infrastructure and desktop computing as well as administrative computing. The heading highlights a constant efficiency gain given the increasing number of CERN users and visitors. The reduction from 2009 to 2010 is due to the fact that revenues likely to be generated from OpenLab in the years to come have not yet been determined.

Administration

The centralised administrative staff allocation (i.e. for the DG offices and services, and the HR and FP Departments) has been reduced to refinance some 170 FTEs over 2008 to 2011 for new initiatives. The variation in materials is due to the provision for the upcoming five-yearly review as well as the management overheads of the approved Marie-Curie fellowship programmes, of which the most recently approved (i.e. COFUND) will end in 2012.

Outreach and Knowledge &Technology Transfer

This heading covers outreach to the general public, education and knowledge & technology transfer. The reductions in both personnel and materials until 2011 are linked to the schedules of EU-funded projects and current end dates of TT partnerships. The core funding from the CERN budget is constant. The CERN Management has enhanced the role of these activities by including knowledge transfer as a dedicated item. This heading is likely to be further developed in the future with additional partnerships and revenues.

Centralised personnel expenses: This mainly covers the CERN contribution to the health insurance premiums for pensioners, arrival and departure indemnities, and unemployment benefits, etc. The unemployment benefits payments have significantly increased over the last two years owing to a higher staff rotation as well as to the economic situation.

With the implementation of IPSAS, CERN will charge as budgetary expenses only the hours actually worked. A new heading has therefore been introduced for a provision equivalent to the amortisation costs of future obligations for saved leave and shift worker compensation amounting to some 170 MCHF in the annual accounts over ten years (amounting to some 17 MCHF as additional expenses per annum). In contrast, the expenses charged for each staff member and activity concerned (included in Table 6) reflect the annual variations in hours actually worked.

Internal taxation: In 2008, this heading corresponds to about 6% of basic salaries. The estimate for 2009 and the following years in both revenues and expenses continues in future years, but is likely to change as a function of the actual staff numbers and their position in the salary grid.

Personnel on detachment relates to staff on detachment to other organisations. The expenses are covered by revenues for the same amounts and are expected to be similar in future years.

Energy and water: The amount earmarked for electricity consumption is increased by 13 MCHF in 2010 to allow for the increased costs for the LHC run in winter 2009/2010. From 2011 onwards, this heading is stable over the subsequent years and is dominated by the electricity consumption for the general infrastructure, running of the accelerator complex and the Computer Centre as well as the water and heating expenses. Currently, CERN is exempt from water taxes in the Canton of Geneva.

Insurances, postal charges and communication costs: The budget estimates are constant (no significant increase of assets with respect to the LHC during the planning period).

Interest and financial cost: The repayment of the EIB loan by April 2009 and the short-terms loans results in a reduction in interest. The remaining interest costs from 2013 onwards stem from the long-term FORTIS loan.

The average of 29% share of expenses for infrastructure and services with respect to the total revenues represents the incompressible overhead to ensure the functioning of the Organization.

Table 5: Projects

Fact Sheet	(in MCHF, 2009 prices, rounded off)	2009 Revised budget	2010	2011	2012	2013	2014	2010-2014 Total
	Projects	**148.1**	**151.6**	**208.1**	**246.2**	**210.5**	**336.9**	**1 153.3**
16.a	**CLIC**	**22.3**	**22.2**	**30.0**	**50.0**	**50.0**	**60.0**	**212.2**
	Personnel	12.2	12.2	15.0	24.0	24.0	28.8	104.0
	Materials	10.1	10.0	15.0	26.0	26.0	31.2	108.3
16.b	**Linear collider detector**	**0.6**	**2.1**	**3.5**	**4.1**	**4.1**	**4.1**	**17.9**
	Personnel	0.3	1.5	2.6	3.0	3.0	3.0	13.0
	Materials	0.2	0.6	0.9	1.1	1.1	1.1	4.9
17	**Linac 4**	**25.3**	**33.1**	**32.0**	**27.7**	**16.8**	**4.6**	**114.2**
	Personnel	7.1	6.5	7.6	7.3	4.0	4.0	29.5
	Materials	18.2	26.6	24.4	20.5	12.8	0.6	84.7
18	**Focus quadrupoles (NbTi)**	**4.8**	**10.8**	**15.6**	**15.6**	**11.8**	**2.7**	**56.6**
	Personnel	1.0	1.1	3.3	4.1	2.2	2.2	13.0
	Materials	3.8	9.7	12.3	11.5	9.5	0.5	43.6
19	**R&D**	**14.8**	**12.5**	**17.4**	**16.9**	**13.1**	**12.5**	**72.3**
19.a	**R&D accelerators**	**5.9**	**7.2**	**7.1**	**6.2**	**2.3**	**1.7**	**24.4**
	Personnel	4.4	4.2	4.1	3.3	1.9	1.5	15.1
	Materials	1.5	3.0	3.0	2.9	0.3	0.2	9.3
19.b, c, d	**Other R&D**	**8.9**	**5.3**	**10.3**	**10.7**	**10.8**	**10.8**	**47.9**
	Personnel	7.5	3.2	4.7	5.1	5.3	5.3	23.6
	Materials	1.3	2.1	5.6	5.6	5.6	5.6	24.4
	LHC upgrade (PS2, SPS, SPL studies, detectors)	**18.6**	**16.4**	**16.3**	**9.6**	**9.6**	**9.6**	**61.6**
	Personnel	6.7	7.2	7.3	5.6	5.6	5.6	31.2
	Materials	11.9	9.3	9.1	4.0	4.0	4.0	30.4
20	**Construction PS2/SPL/S-LHC (machine and detectors)**		**1.0**	**1.0**	**23.4**	**31.1**	**169.4**	**225.9**
	Personnel				3.9	9.1	24.6	37.6
	Materials		1.0	1.0	19.5	22.0	144.8	188.4
21.a	**Accelerator consolidation**	**14.8**	**7.6**	**23.5**	**18.2**	**18.2**	**18.2**	**85.7**
	Personnel	3.3	2.6	3.2	3.3	3.3	3.3	15.6
	Materials	11.5	5.0	20.4	14.9	14.9	14.9	70.1
21.a	**LHC reliability and consolidation**	**28.4**	**17.0**	**18.8**	**46.4**	**41.9**	**41.9**	**166.0**
	Personnel	3.3	4.7	5.3	6.8	6.9	6.9	30.7
	Materials	25.1	12.3	13.5	39.6	35.0	35.0	135.4
21.b	**General infrastructure consolidation**	**18.6**	**28.8**	**49.9**	**34.3**	**13.9**	**13.9**	**140.7**
	Personnel	1.2	1.1	2.2	2.1	1.8	1.8	9.0
	Materials	17.4	27.7	47.8	32.2	12.1	12.0	131.7
	% of total revenues	12.49%	12.74%	17.23%	21.06%	18.35%	29.41%	

Explanations to Table 5:

CLIC: This heading includes the total funding for CTF3, the CLIC study and the CLIC/ILC collaboration. Due to a substantial reduction with respect to last year's MTP, the completion of the feasibility study and a Conceptual Design Report is delayed to the end of 2010. Pending the positive outcome of the feasibility study, the increased allocation of resources from 2011 onwards will allow the preparation of a Technical Design Report to be launched although with a longer schedule.

Linear collider detectors: This constitutes a new heading for CERN's participation in the detector R&D specific to a future linear collider**.**

LINAC 4: The project started in 2008, notably with the civil engineering. With respect to last year's plan, the project has now an EVM baseline consistent with the total allocation until 2014 but with a different profile.

FOCUS Quadrupoles (NbTi): The replacement of the inner triplets project (Phase 1) started essentially with a one-year delay and has now an EVM baseline that is consistent with the total resources allocation (including in-kind contributions). This plan includes the baseline profile for expenses.

LHC Upgrade / Construction of PS2, SPL and S-LHC: The studies for new injectors are now geared to a possible Council decision in mid-2012 on the start of replacement of the existing LHC injectors. Given the uncertainty of the outcome of PS2 and SPL studies at this stage, this heading will be firmed up as the new studies progress. The increase in LHC luminosity for the S-LHC programme will require improvements in the IR of the accelerator (Phase 2) and in the detectors to accept larger radiation levels and higher rates of events in particle bunch collisions. This includes as well CERN's participation in the studies for the upgrades of the LHC detectors in the framework of the S-LHC, including support from the EU (S-LHCPP) for this activity as well as the participation in the construction of the detectors upgrade. The profile will be adjusted with the possibility of bringing funds forward pending the R&D progress and outcome of the discussions on S-LHC funding within the LHC collaborations.

R&D:

Accelerator R&D

This heading includes the funds allocated for the SPL and PS2 studies and improved RF capture, which are all linked to the LHC upgrade and thus explain the higher allocations until 2011. The heading also includes a small but constant part for CERN contributions to the ILC and some seed funding for neutrino factories. Some 6 MCHF are earmarked for the radiation test facilities (HiRadMat).

Other R&D: This includes computing R&D focused on the EU supported projects (like EGEE-3 and ETICS-II), which will end in 2010 (an extension without additional funding for EGEE 3 is under discussion).The Management aims for a continuation of EU support (a strategic need for CERN) but the heading is not likely to maintain the current level since the EGEE 3 follow-up, EGI, will not be hosted at CERN.

Furthermore, this heading includes generic detector R&D and earmarked funds from 2011 as seed funding for other areas such as neutrino physics, etc in the expectation that the bulk of the funding will be contributed by outside collaborators. This is considered as seed funding from 2011 onwards This heading can start only in 2010 due to urgent requirements for LHC operation, new initiatives projects, and consolidation, etc. Nonetheless, CERN aims to diversify its scientific programme (for example, initially by organising diversity and neutrino workshops in 2009) with the aim to serve the entire particle physics community.

Consolidation:

Accelerator consolidation: This heading includes several projects (for example the PS power supply) with different profiles, which explains the variation over time. The reduction in 2010 is linked to the winter run, which means no winter shut-down, resulting in a backlog in 2011 before the heading stabilises from 2012 onwards.

General infrastructure consolidation: With respect to last year's plan, the Management aims to advance earmarked amounts from 2011 onwards to a stable 5 to 10 year programme to renovate the CERN site (technical and general items) in order to enhance efficiency, reliability and, last but not least, safety. In addition, in 2010 to 2012 the heading includes the expected

externally funded costs for the construction of a new auditorium and office space for user facilities and similar services. The planned extension of Restaurant No 1 (Meyrin) and the refurbishment of Restaurant No 3 (Prévessin) are also included in the 2009 and 2010 allocations.

LHC reliability and consolidation: This heading includes items such as the collimator phase II and other smaller size projects that aim for more reliable LHC operation (part of the new initiatives). In the longer term, provisions in materials expenses of the order of 1% of capital investments are made for consolidation of LHC-related technical infrastructure and items with a 5- to 10-year lifetime.

As CERN has for many years had to adopt a repair mode policy rather than a preventive maintenance policy to allow resources to be reallocated for the LHC within a constant revenue budget, many items of equipment have now exceeded their effective lifetime and need to be replaced. The policy of addressing problems as they occurred has reduced annual investments for decades. Already in its March session, the Council agreed to the need to significantly increase this heading to restore and to refurbish CERN's general and technical infrastructure as well as the accelerator and experimental area complexes in order to ensure reliable and safe operation of the Laboratory's accelerator facilities. The new Management has consequently assessed the most urgent needs as part of a 10-year programme to renovate the site and its infrastructure.

Not including the consolidation headings, the amounts available for projects from 2013 onwards amount to some 22% of the anticipated total revenues. Including the consolidation headings, this percentage increases to 29%, i.e. still less than 1/3 of the total budget.

3. Estimated budget balances

Table 6: Estimated budget balances

(in MCHF, 2009 prices, rounded off)	2009 Revised Budget	2010	2011	2012	2013	2014	Total 2010-2014
REVENUES	**1,185.9**	**1,189.9**	**1,207.7**	**1,169.0**	**1,146.9**	**1,145.4**	**5,858.9**
Member States' contributions*	1,098.6	1,099.4	1,099.4	1,099.4	1,099.4	1,099.4	5,497.2
Additional contribution from Host States*	22.3	22.4	25.3				47.7
EU contributions	18.6	12.1	7.0	3.6	1.5		24.2
Personnel paid on team accounts	9.9	9.9	9.9	9.9	9.9	9.9	49.7
Personnel on detachment	0.7	0.7	0.7	0.7	0.7	0.7	3.6
Internal taxation	24.0	24.0	24.0	24.0	24.0	24.0	120.1
Knowledge and technology transfer	1.6	2.5	2.5	2.5	2.5	2.5	12.5
External revenues for new amphitheatre		10.0	30.0	20.0			60.0
Other revenues (including financial revenues)	10.1	8.8	8.8	8.8	8.8	8.8	43.9
OPERATING EXPENSES	**933.9**	**953.2**	**996.6**	**1,018.2**	**967.3**	**1,091.2**	**5,026.5**
Running of scientific programmes and support	**785.8**	**801.6**	**788.5**	**771.9**	**756.8**	**754.3**	**3,873.2**
Scientific programmes	**428.1**	**445.6**	**455.0**	**438.9**	**425.7**	**424.1**	**2,189.3**
LHC (including new initiatives support to detectors)	*264.0*	*280.8*	*292.5*	*279.5*	*268.7*	*268.1*	*1,389.5*
Non-LHC physics and scientific support	*67.3*	*68.4*	*63.7*	*59.8*	*57.4*	*56.4*	*305.8*
Accelerators and areas	*96.8*	*96.3*	*98.8*	*99.6*	*99.6*	*99.6*	*494.0*
General infrastructure and services	**357.7**	**356.1**	**333.5**	**333.1**	**331.0**	**330.2**	**1,683.9**
Infrastructure & services	*208.7*	*199.4*	*193.8*	*194.1*	*193.1*	*193.1*	*973.5*
Centralised personnel budget	*31.1*	*31.1*	*29.6*	*29.6*	*29.6*	*29.6*	*149.5*
Personnel on detachment	*0.7*	*0.7*	*0.7*	*0.7*	*0.7*	*0.7*	*3.5*
Internal taxation	*24.0*	*24.0*	*24.0*	*24.0*	*24.0*	*24.0*	*120.1*
Insurance & postal charges, energy & water	*69.8*	*84.2*	*71.2*	*71.2*	*71.2*	*71.17*	*368.9*
Interests and financial costs	*23.4*	*16.7*	*14.2*	*13.5*	*12.5*	*11.7*	*68.4*
Projects, R&D and consolidation	**148.1**	**151.6**	**208.1**	**246.2**	**210.5**	**336.9**	**1,153.3**
CLIC	*22.3*	*22.2*	*30.0*	*50.0*	*50.0*	*60.0*	*212.2*
Linear collider detector	*0.6*	*2.1*	*3.5*	*4.1*	*4.1*	*4.1*	*17.9*
LINAC 4	*25.3*	*33.1*	*32.0*	*27.7*	*16.8*	*4.6*	*114.2*
Focus quadrupoles (NbTi)	*4.8*	*10.8*	*15.6*	*15.6*	*11.8*	*2.7*	*56.6*
R&D studies	*14.8*	*12.5*	*17.4*	*16.9*	*13.1*	*12.5*	*72.3*
LHC upgrade (PS2, SPL studies, detectors)	*18.6*	*16.4*	*16.3*	*9.6*	*9.6*	*9.6*	*61.6*
Construction PS2/SPL/S-LHC (machine and detectors)		*1.0*	*1.0*	*23.4*	*31.1*	*169.4*	*225.9*
Consolidation and new buildings	*61.8*	*53.4*	*92.2*	*98.9*	*73.9*	*73.9*	*392.4*
OTHER EXPENSES **	**30.9**	**30.9**	**30.9**	**30.9**	**30.9**	**30.9**	**154.5**
Team accounts recharged personnel	9.9	9.9	9.9	9.9	9.9	9.9	49.7
Various	21.0	21.0	21.0	21.0	21.0	21.0	104.8
Housing fund	*3.8*	*3.8*	*3.8*	*3.8*	*3.8*	*3.8*	*19.0*
Stores activity	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.2*	*0.8*
Budget amortization of staff benefits accruals	*17.0*	*17.0*	*17.0*	*17.0*	*17.0*	*17.0*	*85.0*
BALANCE							
Annual balance	221.1	205.8	180.2	119.9	148.7	23.3	
Capital repayment allocated to the budget (Fortis, FIPOI 1 and 2)	-14.0	-15.1	-21.2	-21.9	-22.6	-23.3	
Annual balance allocated to budget deficit	207.1	190.7	159.0	98.0	126.2	0.0	
-Cumulative Balance- - 781.1	**-574.0**	**-383.3**	**-224.2**	**-126.2**	**0.0**	**0.0**	
For information:							
Capital repayment to EIB, FIPOI 3	200.0	0.2	0.2	0.2	0.2	0.2	

* In order to cover the incompressible costs for the reliable operation of the LHC and its infrastructure, the Member States' contributions are kept constant after 2011 except for the special Host States' contributions which are due to end in 2011.

** Personnel paid on team accounts, Housing fund, Stores activity, Depreciation expenses, IPSAS reconciliation, Budget amortization for staff benefits accruals

Explanations to Table 6:

Table 6 compares the expected revenues with the estimated expenses for the years 2009 (revised 2009 Budget) until 2014. Expenses headings are shown in P+M. The indexation of the Member States' contributions by 2% from 2008 to 2009 prices does not cover the real cost of expenses indexation. This reduces the amount available for the scientific programme by 45 MCHF in order to maintain the cumulative balance.

As can be seen, the subtotal 'Running of scientific programme and support' is constant over time apart from the advances needed to cover the cost of the new Computer Centre.

The LHC programme is clearly accorded overall priority and a new Computer Centre has therefore been included as well as higher allocations for operation and spare parts induced by the LHC repairs. In addition, resources will also be allocated to establishing a physics analysis centre to reposition CERN as a hub for analysis of the physics data from the experiments it hosts.

The non-LHC physics programme gets the minimum support from CERN to allow it to operate (mostly interface with the infrastructure and accelerators), on the assumption that the cost of providing beams cannot be supported and shared between the different experiments. Some of these experiments, such as ISOLDE, AD, and n-TOF, need new investment, requested by their respective communities, which have long made use of CERN facilities. New proposals for projects might emerge during the Physics Diversity Workshop in May ("New Opportunities in the Physics Landscape at CERN" workshop, devoted to general non-LHC topics) and the dedicated neutrino workshop in October, which will subsequently be approved by the Council following presentation to the SPC.

Projects and R&D initiatives are very limited in the coming years given the need to repay LHC loans and even to advance funds for the most urgent consolidation items.

The manpower limit of 2250 staff FTEs and the LHC incident will result in a delay of the outcome of R&D studies for the new initiatives and projects, especially for the SPL and PS2 studies, and to a lesser extent for the CLIC feasibility study. Thus, the possible start of replacing parts of the LHC injector chain and the LHC luminosity upgrade (S-LHC) will have to be delayed to 2013, with the target of a Council decision concerning Phase 2 scheduled for 2012.

Other expenses covers the personnel charged to team accounts and the housing fund with corresponding revenue headings, the usual balance of the stores activity and the budget amortization of staff benefits accruals. As explained, the heading is needed to amortize the existing staff's accrued saved leave and shift compensation rights. This provision amounts to some 170 MCHF in the 2008 annual accounts and its amortization is envisaged over 10 years. Without this heading, the active staff strength would have to go well below the 2250 FTEs, i.e. to a level that is too low to fulfil the objectives of reliably operating the LHC as well as preparing for the new projects.

The capital repayment of the LHC loans obliges CERN to limit the allocation for consolidation, R&D and projects to about 13% of the revenues in 2009 and 2010, whereas the amount allocated for capital repayment reaches over one quarter of the Member States' contributions over the same period. Only from 2012 onwards can the allocation for projects increase to a healthier share of about one quarter of the contributions.

4. Comparison MTP 2008 versus MTP 2009

Table 7: Comparison MTP 2008 versus MTP 2009

(in MCHF, current prices, rounded off)	2009			2010			2011			2012			2013			Total 2009-2013			
	MTP 2008 (2008 pr.)	MTP 2009 (2009 pr.)	Variat.	MTP 2008 (2008 pr.)	MTP 2009 (2009 pr.)	Variat.	MTP 2008 (2008 pr.)	MTP 2009 (2009 pr.)	Variat.	MTP 2008 (2008 pr.)	MTP 2009 (2009 pr.)	Variat.	MTP 2008 (2008 pr.)	MTP 2009 (2009 pr.)	Variat.	MTP 2008 (2008 pr.)	MTP 2008 (2009 pr.)	MTP 2009 (2009 pr.)	Variat.
LHC programme (incl. projects)	**243.1**	**264.0**	**20.9**	**238.3**	**280.8**	**42.5**	**230.2**	**292.5**	**62.4**	**230.2**	**279.5**	**49.3**	**230.2**	**268.7**	**38.5**	**1 171.9**	**1 203.9**	**1 385.5**	**181.6**
Personnel	156.8	156.7	-0.1	152.7	147.2	-5.5	153.4	153.2	-0.2	153.4	155.2	1.8	153.4	154.4	1.0	769.7	790.7	766.7	-24.0
Materials	86.3	107.3	21.0	85.6	133.6	48.0	76.8	139.3	62.5	76.8	124.3	47.5	76.8	114.3	37.5	402.2	413.2	618.8	205.6
Other programmes	**150.7**	**164.1**	**13.4**	**152.5**	**164.8**	**12.3**	**149.0**	**162.5**	**13.5**	**145.7**	**159.4**	**13.7**	**145.7**	**157.1**	**11.4**	**743.6**	**763.9**	**807.8**	**43.9**
Personnel	109.6	113.1	3.6	108.7	116.1	7.4	107.9	117.2	9.3	103.1	111.6	8.5	103.1	111.4	8.3	532.4	546.9	569.4	22.5
Materials	41.1	50.9	9.8	43.8	48.7	4.9	41.1	45.3	4.2	42.6	47.8	5.2	42.6	45.7	3.1	211.2	217.0	238.4	21.4
Infrastructure and services	**324.6**	**357.7**	**33.1**	**316.6**	**356.1**	**39.5**	**313.7**	**333.5**	**19.8**	**315.2**	**333.1**	**17.9**	**314.5**	**331.1**	**16.6**	**1 584.6**	**1 627.8**	**1 711.5**	**83.7**
Personnel	160.4	182.7	22.3	159.0	175.6	16.6	161.0	171.5	10.5	163.2	171.5	8.3	163.2	170.6	7.4	806.8	828.9	871.9	43.1
Materials	164.1	175.0	10.9	157.5	180.4	22.9	152.7	162.1	9.4	152.1	161.6	9.5	151.3	160.5	9.1	777.7	799.0	839.5	40.6
Projects	**104.1**	**148.1**	**44.0**	**105.4**	**151.6**	**46.2**	**215.5**	**208.1**	**-7.4**	**390.6**	**246.2**	**-144.3**	**390.5**	**210.5**	**-180.0**	**1 206.1**	**1 239.0**	**964.5**	**-274.5**
Personnel	40.2	47.1	6.9	37.1	44.4	7.3	68.6	55.2	-13.3	91.9	68.4	-23.4	91.8	67.1	-24.6	329.5	338.4	282.3	-56.2
Materials	63.9	101.0	37.1	68.3	107.2	38.8	146.9	152.8	5.9	298.7	177.8	-120.9	298.7	143.4	-155.4	876.6	900.6	682.2	-218.4
Grand Total	**822.4**	**933.9**	**111.5**	**812.8**	**953.2**	**140.5**	**908.4**	**996.6**	**88.3**	**1 081.7**	**1 018.2**	**-63.5**	**1 081.1**	**967.3**	**-113.6**	**4 706.2**	**4 834.7**	**4 869.2**	**34.6**
% of total revenues	72.22%	78.75%		71.76%	80.11%		80.57%	82.52%		98.01%	87.10%		97.95%	84.34%					

Explanations to Table 7:

Table 7 compares the 2008 MTP allocations (in 2008 prices) by programme to the 2009 MTP allocations. With respect to the 2008 MTP tables, some sub-headings were re-allocated between programmes (such as maintenance for informatics infrastructure from projects to infrastructure, new heading LHC spares, data analysis centre) and are presented in Table 7 to compare like with like.

Overall, when the 2008 MTP is expressed in 2009 prices, the variation with respect to the 2009 MTP is 34.6 MCHF, which essentially consist of the carry-forward of 29.4 MCHF (projects and committed but unspent items at the end of 2008) and the positive net impact of variations in revenues (from EU, anticipated KTT income, etc.).

Within the period 2009 to 2014, the main changes are as follows:

- Sector 3-4 repair (starting in 2008), 41 MCHF;
- Additional annual operation of LHC and accelerator complex (15 MCHF p.a. from 2010 onwards);
- LHC spares from 2011 with up to 25 MCHF per annum;
- Linear Collider Detector R&D (18 MCHF cumulative);
- Re-profiling of consolidation and project headings (no impact on the integral amounts earmarked);
- Re-profiling of computing fabrics materials for a new computing centre (60 MCHF in 2010-2012);
- New auditorium and user facilities pending additional revenues (60 MCHF in 2010-2012);
- HiRadMat of 6 MCHF;
- Supported S-LHC phase 1 R&D and construction (machine and detectors);
- Amortization of staff benefit accruals (of 17 MCHF p.a.).

The additional expenses are funded by:

- Delaying the outcome of approved projects and R&D studies to 2012 with a subsequently delayed start of the S-LHC phase 2 construction (machine and detectors);
- Reduction of provisions earmarked for CLIC TDR to 50 MCHF, later 60 MCHF per annum.

IV. 2010 Draft Budget

1. Overview of Revenues and Expenses

Table 8: Overview of Revenues and Expenses

(in MCHF, 2009 prices, rounded off)	2009 Revised Budget	2010 Draft Budget	Variations of 2010 Draft Bud. with respect to 2009 Rev. Bud.	
REVENUES	**1 185.9**	**1 189.9**	**0.3%**	
Member States' contributions	1 098.6	1 099.4	0.1%	
Additional contribution from Host States	22.3	22.4	0.4%	
EU contributions	18.6	12.1	-35.1%	
Personnel paid on team accounts	9.9	9.9		
Personnel on detachment	0.7	0.7	0.7%	
Internal taxation	24.0	24.0		
Knowledge and technology transfer	1.6	2.5	53.1%	
External revenues for new amphitheatre		10.0		
Other revenues (including financial revenues)	10.1	8.8	-13.4%	
OPERATING EXPENSES	**933.9**	**953.2**	**2.1%**	
Running of scientific programmes and support	**785.8**	**801.6**	**2.0%**	
Scientific programmes	**428.1**	**445.6**	**4.1%**	
LHC (including new initiatives support to detectors)	*264.0*	*280.8*	*6.4%*	
Non-LHC physics and scientific support	*67.3*	*68.4*	*1.8%*	
Accelerators and areas	*96.8*	*96.3*	*-0.5%*	
General infrastructure and services	**357.7**	**356.1**	**-0.5%**	
Infrastructure & services	*208.7*	*199.4*	*-4.4%*	
Centralised personnel budget	*31.1*	*31.1*	*-0.1%*	
Personnel on detachment	*0.7*	*0.7*		
Internal taxation	*24.0*	*24.0*		
Insurance & postal charges, energy & water	*69.8*	*84.2*	*20.6%*	
Interests and financial costs	*23.4*	*16.7*	*-28.8%*	
Projects, R&D and consolidation	**148.1**	**151.6**	**2.3%**	
CLIC	*22.3*	*22.2*	*-0.1%*	
Linear collider detector	*0.6*	*2.1*	*263.2%*	
LINAC 4	*25.3*	*33.1*	*30.8%*	
Focus quadrupoles (NbTi)	*4.8*	*10.8*	*125.1%*	
R&D studies	*14.8*	*12.5*	*-15.3%*	
LHC upgrade (PS2, SPL studies, detectors)	*18.6*	*16.4*	*-12.0%*	
Construction PS2/SPL/S-LHC (machine and detectors)		*1.0*		
Consolidation and new buildings	*61.8*	*53.4*	*-13.5%*	
OTHER EXPENSES *	**30.9**	**30.9**		
Team accounts recharged personnel	9.9	9.9		
Various	21.0	21.0		
Housing fund	*3.8*	*3.8*		
Stores activity	*0.2*	*0.2*		
Budget amortization of staff benefits accruals	*17.0*	*17.0*		
BALANCE				
Annual balance	221.1	205.8	-6.9%	
Capital repayment allocated to the budget (Fortis, FIPOI 1 and 2)	-14.0	-15.1	7.5%	
Annual balance allocated to budget deficit	207.1	190.7	-7.9%	
-Cumulative Balance- - 781.1	**-574.0**	**-383.3**	**-33.2%**	

For information:		
Capital repayment to EIB, FIPOI 3	200.0	0.2

* Personnel paid on team accounts, Housing fund, Stores activity, Depreciation expenses, IPSAS reconciliation, Budget amortization for staff benefits accruals

2. Revenues

The scale of Member States' contributions is the subject of a separate paper being presented to Council and its committee in the June session. The percentage distribution by Member State will be translated into Swiss francs and presented to the Council and its committees once the outcome of the current discussions on the scale of Member States' contributions and the applicable cost-variation-indexes is known. The contribution basis in 2009 prices as well as the other revenue headings are presented in Table 8.

3. Expenses by Scientific and Non-Scientific Programmes

Figure 9: 2009 Budget (Personnel, Materials and Debt servicing)

* Including Centralized personnel expenses and Personnel on detachment (3.3%), Energy and water (8.1%), Insurance and postal charges (0.7%)

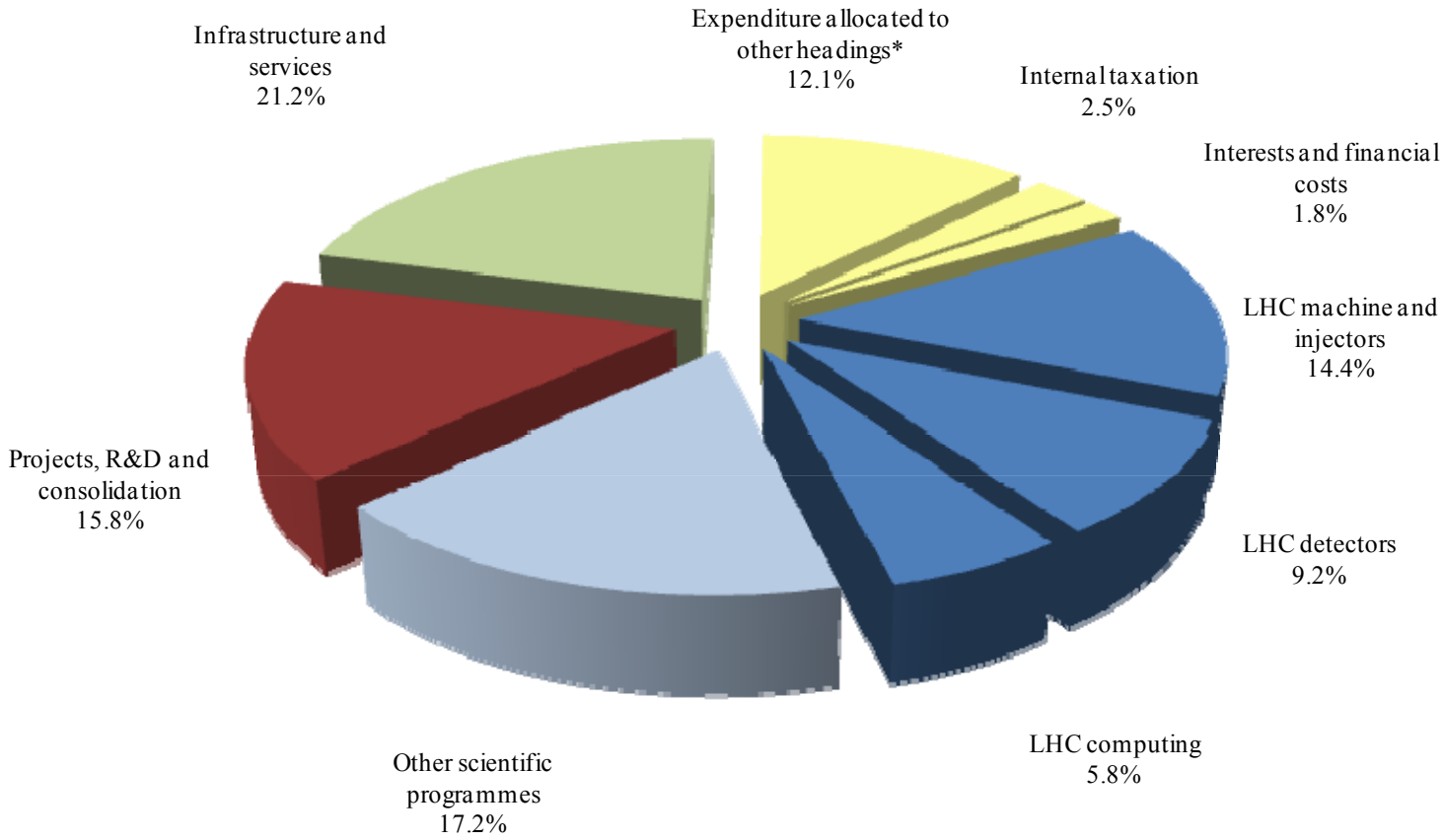


Table 10: Scientific Programme

2009 Revised Budget (2009 prices)				Fact Sheet	Activity	2010 goals	2010 Draft Budget (2009 prices)				Variations of 2010 Draft Bud. with respect to 2009 Rev. Bud.
FTE	kCHF						FTE	kCHF			
Personnel	Personnel	Materials	Total				Personnel	Personnel	Materials	Total	
903	**156 670**	**107 320**	**263 990**		**LHC programme (incl. projects)**		**847**	**147 225**	**133 585**	**280 810**	**6.4%**
424	**70 985**	**64 810**	**135 795**	**1**	**LHC machine and injectors**	Operation troughout 2010 with around 250pb^-1 delivery to	**400**	**66 440**	**71 130**	**137 570**	**1.3%**
417	69 615	36 770	106 385		LHC machine and experimental areas	experiments.	391	64 830	60 615	125 445	17.9%
		27 505	27 505		Sector 3-4 repair				10 000	10 000	-63.6%
					Spares						
8	1 370	535	1 905		LHC injectors (for heavy Ions)	Commisioning of initial Pb82+ ion beam	9	1 610	515	2 125	11.5%
388	**68 960**	**23 395**	**92 355**		**LHC detectors**		**350**	**63 120**	**24 510**	**87 630**	**-5.1%**
129	22 840	4 055	26 895	2	ATLAS detector	Data taking, first measurements of Std Model physics processes	115	20 790	4 455	25 245	-6.1%
120	20 725	3 725	24 450	3	CMS detector	Trigger & physics commissioning, measure Std model processes	111	20 035	3 430	23 465	-4.0%
53	9 630	2 320	11 950	4	ALICE detector	PP data taking and first PB-PB data taking	46	8 570	2 280	10 850	-9.2%
53	9 795	2 590	12 385	5	LHCb detector	Data taking to Std Model expectation, improve on TEVATRON limits	50	9 200	2 000	11 200	-9.6%
34	5 970	3 520	9 490	6	Common items, other experiments (inc. Totem, LHCf)	Detector and global commisioning of Totem, physics analysis LHCf	30	4 525	2 955	7 480	-21.2%
		7 185	7 185		Detectors re-scoping				9 390	9 390	30.7%
91	**16 725**	**19 115**	**35 840**	**7**	**LHC computing**	Sustained transfer of LHC data, data export to Tier 1 centres up to 1 GB	**97**	**17 665**	**37 945**	**55 610**	55.2%
658	**113 145**	**50 920**	**164 065**		**Other programmes**		**686**	**116 070**	**48 700**	**164 770**	**0.4%**
21	**3 480**	**2 990**	**6 470**	**8**	**Non-LHC physics**	Meet the goals set by the research board	**20**	**3 260**	**4 800**	**8 060**	**24.6%**
70	**10 320**	**1 685**	**12 005**	**9.a**	**Theory**	Support TH experiments and TH community	**66**	**9 805**	**1 770**	**11 575**	**-3.6%**
20	**3 825**	**2 300**	**6 125**	**9.b**	**Physics analysis centre**	Starting works for creating the Physics Analysis Centre	**19**	**3 745**	**2 085**	**5 830**	**-4.8%**
172	**31 405**	**11 245**	**42 650**		**Scientific support**	Safe, efficient , reliable operation of the experiments, support to users	**201**	**35 065**	**7 900**	**42 965**	**0.7%**
34	**5 520**	**2 470**	**7 990**	**10**	**Low and medium accelerators**	Delivery of beams to all users with maximum overall efficiency,	**32**	**5 290**	**2 955**	**8 245**	**3.2%**
189	**31 835**	**17 560**	**49 395**	**10**	**PS and SPS complexes**	enabling LHC injection and delivery to non-LHC experimental facilities	**186**	**30 905**	**19 590**	**50 495**	**2.2%**
153	**26 760**	**12 670**	**39 430**	**10**	**Accelerator technical services**	in parallel	**164**	**28 000**	**9 600**	**37 600**	**-4.6%**
1 561	**269 815**	**158 240**	**428 055**		**Grand Total**		**1 533**	**263 295**	**182 285**	**445 580**	**4.1%**
	22.75%	13.34%	36.09%		% of total revenues			22.13%	15.32%	37.45%	

Explanations to Table 10:

Whereas the revised 2009 Budget includes the amount earmarked for LHC sector 3-4 repair, the 2010 operations heading increases to allow for the long run throughout the winter of 2010.

The ongoing support activities such as scientific support, low and medium energy accelerators and PS and SPS complexes show a small increase related to the long run. In contrast, Theory reduces due to allocations from EU supported projects ending in 2009. The manpower for the physics analysis centre received includes the former white paper funding for additional manpower for physics data analysis and some seed funding, thus reducing slightly in 2010. Following the non-LHC diversification workshop, the earmarked amounts increase to allow for implementing the outcome in 2010.

The heading Accelerator Technical Services includes all staff in the accelerator activities who benefit from pre-retirement or long-term saved leave programmes as well as shift work compensation.

Table 11: Infrastructure and services

2009 Revised Budget (2009 prices) FTE Personnel	kCHF Personnel	kCHF Materials	kCHF Total	Fact Sheet	Activity	2010 goals	2010 Draft Budget (2009 prices) FTE Personnel	kCHF Personnel	kCHF Materials	kCHF Total	Variations of 2010 Draft Bud. with respect to 2009 Rev. Bud.
757	**182 705**	**175 015**	**357 720**		**Infrastructure and services**		**712**	**175 635**	**180 425**	**356 060**	**-0.5%**
110	**17 815**	**2 305**	**20 120**	**11.a**	**Manufacturing facilities**	Avoid delays in projects where design/production is on critical path	**102**	**16 760**	**2 080**	**18 840**	**-6.4%**
150	**23 400**	**36 415**	**59 815**	**11.b**	**General facilities and logistics**		**138**	**21 800**	**35 745**	**57 545**	**-3.8%**
152	**25 160**	**18 145**	**43 305**	**11.c**	**Informatics**		**140**	**23 545**	**16 470**	**40 015**	**-7.6%**
128	**21 260**	**9 440**	**30 700**	**12**	**Safety, health and environment**	Safe operation of LHC and other facilities (radioprotection, cryogenics)	**112**	**19 020**	**7 530**	**26 550**	**-13.5%**
175	**30 545**	**6 850**	**37 395**	**13**	**Administration**	Balance cent/non-centr. admin., impl. KPI's, review inhouse-outsourcing	**181**	**30 880**	**8 130**	**39 010**	**4.3%**
41	**8 695**	**8 655**	**17 350**	**14**	**Outreach and KTT**		**38**	**7 815**	**9 640**	**17 455**	**0.6%**
3	**55 830**	**69 790**	**125 620**	**15**	**Centralised expenses**		**3**	**55 815**	**84 170**	**139 985**	**11.4%**
	31 115		31 115		Centralised personnel expenses			31 095		31 095	-0.1%
	24 015		24 015		Internal taxation			24 015		24 015	
3	700		700		Personnel on detachment		3	705		705	0.7%
		62 795	62 795		Energy and water				77 175	77 175	22.9%
		6 995	6 995		Insurances and postal charges				6 995	6 995	
		23 415	**23 415**	**15**	**Interests and financial costs**	Reducing short-term loans			**16 660**	**16 660**	**-28.8%**
	15.41%	14.76%	30.16%		% of total revenues			14.76%	15.16%	29.92%	

Explanations to Table 11:

The baseload of the ongoing infrastructure and services results in an overall constant budget allocation.

The reduction in manufacturing and general facilities is related to the ongoing reduction of personnel as planned since 2006, partially redistributed to projects and the specific logistic support for the sector 3-4 repair in 2009.

Informatics reduces, essentially due to not yet determined revenues from OpenLab for 2010.

The higher allocation for materials in Administration is due to the amount earmarked for non-Member States' project associates and students (not yet distributed by activity), an increase in HR management for personnel, the five-yearly review and the training budget for CERN personnel.

Outreach and KTT activities are at a similar level and will be adjusted as a function of KTT-related revenues.

The centralised personnel budget is expected to increase slightly due to expected arrivals and departures. This heading will be adjusted for the variation of annual leave taken by the personnel.

Internal taxation, with an identical heading in revenues, is kept constant but will depend on the actual positions of the staff in the salary grid.

The luminosity run over the winter of 2009/2010 requires an increase of the amount foreseen for energy.

The reduction for interests and financial costs is linked to the repayment of LHC loans, notably to the full repayment of the EIB loan in April 2009.

Table 12: Projects

2009 Revised Budget (2009 prices)				Fact Sheet	Activity	2010 goals	2010 Draft Budget (2009 prices)				Variations of 2010 Draft Bud. with respect to 2009 Rev. Bud.
FTE	kCHF						FTE	kCHF			
Personnel	Personnel	Materials	Total				Personnel	Personnel	Materials	Total	
290	**47 100**	**101 030**	**148 130**		**Projects**		**274**	**44 380**	**107 170**	**151 550**	**2.3%**
75	**12 180**	**10 080**	**22 260**	**16.a**	**CLIC**	Complete CLIC Test Facility installation	**75**	**12 235**	**10 000**	**22 235**	**-0.1%**
2	**330**	**240**	**570**	**16.b**	**Linear collider detector**	Simaluation studies, setting up targeted hardware R&D program	**10**	**1 515**	**555**	**2 070**	**263.2%**
43	**7 080**	**18 230**	**25 310**	**17**	**Linac 4**	Complete CE, launch constr of acc. struct. and main comp. RFQ comm	**40**	**6 545**	**26 550**	**33 095**	**30.8%**
6	**1 045**	**3 765**	**4 810**	**18**	**Focus quadrupoles (NbTi)**	Completion TDR, start construction model magnets	**8**	**1 115**	**9 710**	**10 825**	**125.1%**
73	**11 935**	**2 835**	**14 770**	**19**	**R&D**		**46**	**7 435**	**5 070**	**12 505**	**-15.3%**
30	4 390	1 490	5 880	**19.a**	R&D accelerators	Constr. & test prototypes, detailed design subsystems	26	4 225	2 960	7 185	**22.2%**
44	7 545	1 345	8 890	**19.b, c, d**	Other R&D		20	3 210	2 110	5 320	**-40.2%**
46	**6 735**	**11 905**	**18 640**		**LHC upgrade (PS2, SPS, SPL studies, detectors)**		**46**	**7 150**	**9 255**	**16 405**	-12.0%
				20	**Construction PS2/SPL/S-LHC (machine and detectors)**	Preparation of infrastructure works			**1 000**	**1 000**	
19	**3 295**	**11 500**	**14 795**	**21.a**	**Accelerator consolidation**	Add. cons. of notably PS control access system, SPS 18 kV substations	**15**	**2 595**	**5 040**	**7 635**	-48.4%
20	**3 335**	**25 060**	**28 395**	**21.a**	**LHC reliability and consolidation**		**30**	**4 705**	**12 320**	**17 025**	-40.0%
8	**1 165**	**17 415**	**18 580**	**21.b**	**General infrastructure consolidation**	Refurbishment of buildings, Restaurant 1 extension, Rest 3 renewal	**7**	**1 085**	**27 670**	**28 755**	54.8%
	3.97%	8.52%	12.49%		% of total revenues			3.73%	9.01%	12.74%	

Explanations to Table 12:

All projects experienced a delay in terms of meeting scheduled objectives due to substantial amounts of manpower still being focused on LHC following the sector 3-4 incident in 2008. The new heading linear collider detector R&D was introduced in 2009 to essentially start in 2010.

The allocations for 2009 and 2010 were reprofiled to respect the baseline planning in the EVM tools for the Linac 4 and Focus quadrupoles replacements.

Accelerator R&D increases as a consequence of the EUCARD project, whereas other R&D reduces, mainly due to the ending of EU-supported IT R&D programmes such as EGEE 3. The activities 'LHC upgrade' with specific R&D studies for the LHC injector upgrade and detectors (including the EU project S-LHCPP) and the infrastructure consulting studies for LHC injectors continue.

The reduction in accelerator and LHC consolidation is linked to the long run over the winter of 2009/2010, which entails advancing some projects to 2009 and postponing others to the 2010/2011 shutdown. As a function of progress, some amounts might slip from 2009 into 2010. The LHC reliability includes the cost of increased helium storage capacity at the surface during a shutdown.

The general consolidation heading increase is due to the start of the new auditorium and office space for users facilities pending external funding for this project.

Energy and water

Table 13: Expenses – Energy and water

Activity	2009 Revised Budget (2009 prices)	2010 Draft Budget (2009 prices)	Variations of 2010 Draft Bud. with respect to 2009 Rev. Bud.
Energy and water (baseload)	**22.3**	**22.6**	**1.35%**
Electricity	9.6	9.7	1.04%
Heating oil and gas	4.7	5.5	17.02%
Water and miscellaneous	8.0	7.4	-7.50%
Energy for basic programmes	**40.5**	**54.6**	**34.68%**
Particle physics	1.9	2.0	5.26%
Data handling	1.2	1.2	
Accelerators:	11.9	12.5	4.69%
AD	*0.5*	*0.5*	
PS	*2.1*	*2.1*	
SPS	*9.4*	*9.9*	
LHC	25.1	38.5	53.39%
CNGS	0.4	0.4	
Grand Total Energy programme in MCHF	**62.8**	**77.2**	**22.85%**

Explanations to Table 13:

An amount of 22.6 MCHF is earmarked for the baseload of the CERN sites (administration, workshops, laboratories, component testing, and lighting), fuel (heating) and water (cooling and drinking water). In addition, 54.6 MCHF for power consumption is included in the budgets for the basic programmes.

With respect to a normal year, some 13 MCHF are allocated to fund the electricity supply over the winter of 2009/2010 to allow for a significant integrated luminosity to be delivered to the detectors.

Fixed assets projects

Table 14: Expenses – Fixed assets projects

(in kCHF)

2009 Revised Budget * (2009 prices)			Project	2010 Draft Budget * (2009 prices)			Variations of 2010 Draft Bud. with respect to 2009 Rev. Bud.
Personnel	**Materials**	**Total**		**Personnel**	**Materials**	**Total**	
27 755	**163 660**	**191 415**	**Projects**	**30 015**	**153 520**	**183 535**	**-4.1%**
820	28 040	28 860	LHC machine and injectors	1 010	10 515	11 525	-60.1%
-	*27 505*	*27 505*	*Sector 3-4 repair*	-	*10 000*	*10 000*	*-63.6%*
820	*535*	*1 355*	*LHC injectors*	*1 010*	*515*	*1 525*	*12.5%*
-	8 125	8 125	LHC detectors	-	9 390	9 390	15.6%
-	*185*	*185*	*Alice detector*	-	-	-	*/*
-	*755*	*755*	*LHCb detector*	-	-	-	*/*
-	*7 185*	*7 185*	*Detectors re-scoping*	-	*9 390*	*9 390*	*30.7%*
1 185	14 715	15 900	LHC computing	-	33 090	33 090	108.1%
1 185	*14 715*	*15 900*	*LHC Computing Grid*	-	*13 090*	*13 090*	*-17.7%*
-	-	-	*Green Computing Centre*	-	*20 000*	*20 000*	*/*
80	890	970	NA62 construction	155	910	1 065	9.8%
-	2 510	2 510	Electronics pool	-	-	-	/
1 105	4 380	5 485	Magnet rescue facility	625	-	625	-88.6%
180	7 865	8 045	Extension building 40	170	3 520	3 690	-54.1%
295	4 360	4 655	Radioactive waste management	195	2 090	2 285	-50.9%
10 025	10 060	20 085	CLIC	10 080	9 950	20 030	-0.3%
60	-	60	Linear collider detector R&D	1 515	395	1 910	/
5 315	18 230	23 545	Linac 4	5 730	26 550	32 280	37.1%
700	3 205	3 905	Focus quadrupoles (NbTi)	785	9 475	10 260	162.7%
195	7 305	7 500	LHC upgrade	1 365	2 605	3 970	-47.1%
195	*3 835*	*4 030*	*RF 200 MHz system*	*190*	*2 605*	*2 795*	*-30.6%*
-	*3 470*	*3 470*	*LHC detectors upgrade*	*1 175*	-	*1 175*	*-66.1%*
3 295	11 500	14 795	Accelerator consolidation	2 595	5 040	7 635	-48.4%
3 335	25 060	28 395	LHC reliability and consolidation	4 705	12 320	17 025	-40.0%
1 165	17 415	18 580	General infrastructure consolidation	1 085	27 670	28 755	54.8%

* Excluding EU projects.

4. Summary of Expenses by Nature

Table 15: Materials expenses by nature (including debt servicing costs)

Nature	2009 Revised Budget (2009 prices)	2010 Draft Budget (2009 prices)	Variations of 2010 Draft Bud. with respect to 2009 Rev. Bud.
Operating expenses	**410 870**	**453 220**	**10.31%**
Supplies and consumables	***302 492***	***350 965***	***16.02%***
Goods, consumables and supplies	181 797	219 135	20.54%
Electricity, heating gas and water	62 795	77 175	22.90%
Industrial services (service contracts)*	57 900	54 655	-5.60%
Other operating expenses	***108 378***	***102 255***	***-5.65%***
Repair and maintenance (other indus. services contracts)*	42 140	35 745	-15.18%
Third party payments and consultants	32 510	32 782	0.84%
Other overheads **	33 728	33 728	
Non-operating expenses	**23 415**	**16 660**	**-28.85%**
Interests and financial costs	***23 415***	***16 660***	***-28.85%***
Fortis bank	14 570	14 120	-3.09%
EIB	1 255		
Short-term interests	7 340	2 290	-68.80%
Bank charges	250	250	
TOTAL MATERIALS in kCHF	**434 285**	**469 880**	**8.20%**

* Variation for total of industrial services: -9.64%

** Including insurance and postal charges, CERN contributions to collaborations

Figure 16: Breakdown of materials expenses by nature

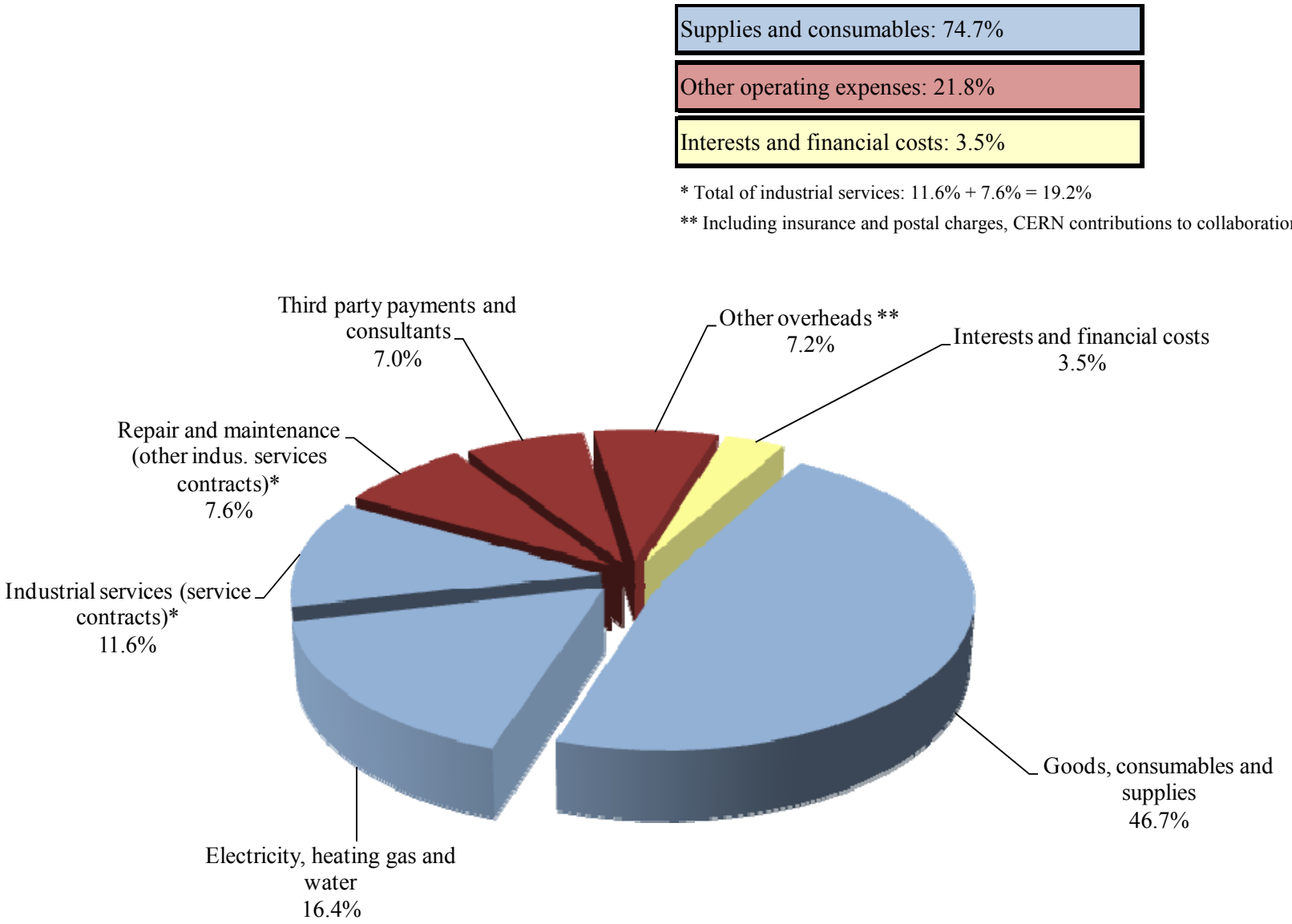


Table 17: Personnel Expenses by Nature

Nature	2009 Revised Budget (2009 prices)	2010 Draft Budget (2009 prices)	Variations of 2010 Draft Bud. with respect to 2009 Rev. Bud.
Staff members	**458 035**	**446 225**	**-2.58%**
Basic salaries*	***260 007***	***252 615***	***-2.84%***
Allowances	***56 635***	***54 440***	***-3.88%***
Non-residence	18 975	18 050	
Family allowances	21 350	20 690	
Special allowances	3 310	3 150	
Overtime	1 905	1 830	
Various allowances	10 230	9 875	
Termination indemnities	865	845	
Social contributions	***86 264***	***84 060***	***-2.55%***
Pension Fund	65 890	64 225	
Health insurance	20 374	19 835	
Centralised personnel budget	***31 114***	***31 095***	***-0.06%***
Installation, recruitment and termination of contracts	6 623	6 295	
Additional periods of membership in the Pension Fund for shift work	4 050	4 050	
Contribution to health insurance for pensioners	20 441	20 750	
Internal taxation	***24 015***	***24 015***	
Fellows & Associates (including overhead for students)	**41 165**	**36 635**	**-11.00%**
Apprentices	**420**	**450**	**7.14%**
TOTAL PERSONNEL in kCHF	**499 620**	**483 310**	**-3.26%**

* Including the withheld salary for short-term SLS participations.

Explanations to Table 17:

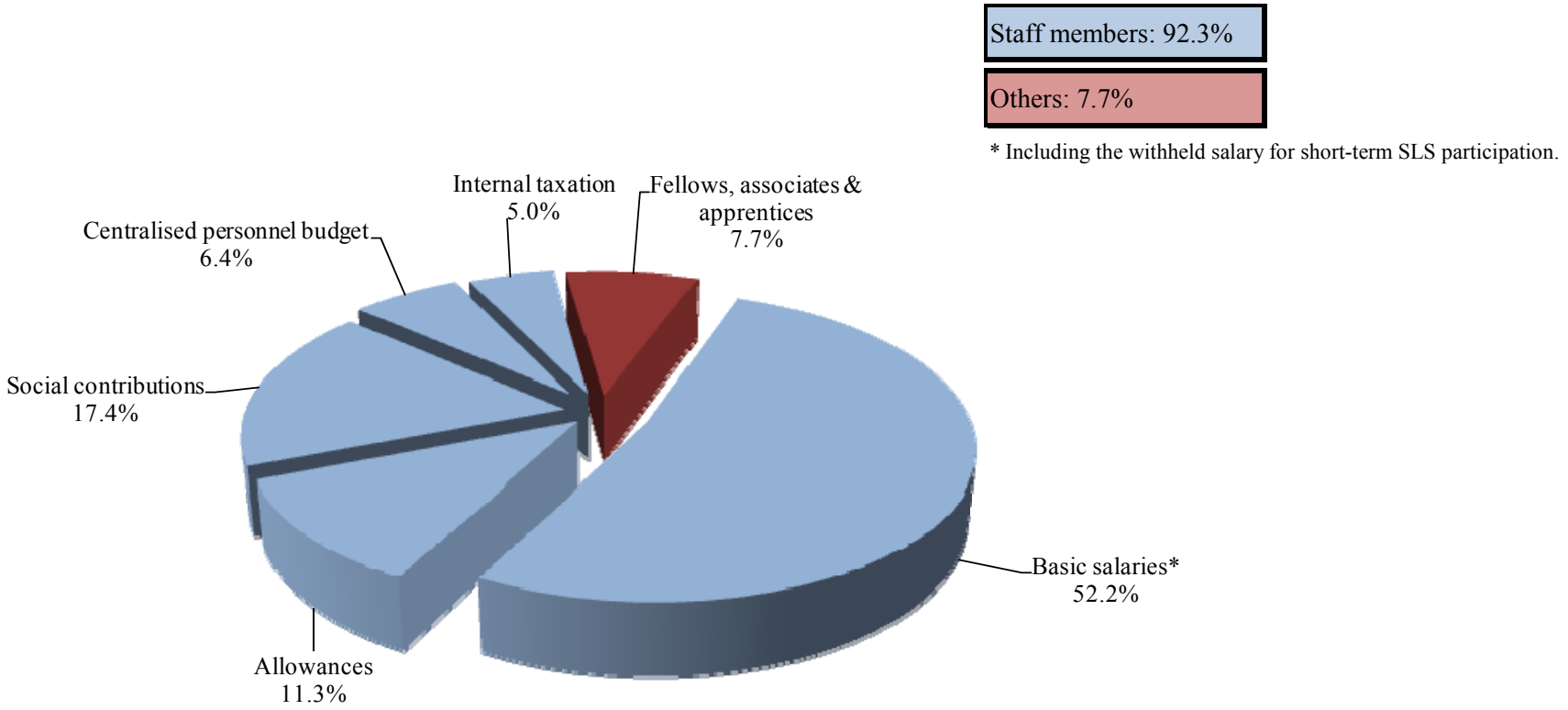
The total CERN Personnel Budget for 2010 amounts to 483.3 MCHF.

The budget (including centralized expenses) for staff members totals 446.2 MCHF.

The Centralized Personnel Budget totals 31.1 MCHF excluding former firemen compensated for shift work (these are included in the budget for total man-year costs). Removal and installation expenses, contract terminations and unemployment indemnities are expected to cost about 6.3 MCHF, additional periods of membership in the Pension Fund for shift work should amount to some 4.1 MCHF and contributions to pensioners' health insurance should amount to 20.8 MCHF.

Internal taxation is expected to amount to 24.0 MCHF and is also shown as revenues for the Organization, the amount will depend on the staff positions in the salary grid.

Figure 18: Personnel expenses breakdown by nature



5. Estimated Financial Position of the Organization
Statement of Cash Flow

Table 19: Estimated statement of Cash Flow for Financial Years 2009 and 2010

(in MCHF, rounded off, estimated as at 27/05/2009)	2009 (2009 prices)	2010 (2009 prices)
(A) START OF THE YEAR		
Liquid assets brought forward	62	
Outstanding short-term loans	409	* 345
(1) CASH INFLOW	**1 210**	**1 265**
Contributions	1 062	1 114
Special cash contributions	17	17
Teams and Collaborations	90	100
Other income, EU,TT, sales	41	34
(2) CASH OUTFLOW	**1 207**	**1 070**
Expenses	887	935
Repayment EIB loan	200	
Teams, Collaborations and other	83	103
Interests and financial costs	23	17
Capital repayment Fortis + FIPOI	14	15
(3) VARIATION OF CASH POSITION	**2**	**195**
(B) END OF THE YEAR		
Estimated outstanding Short-term loans	**345**	**150**

* For 2010, it is an estimated amount.

Loan from the EIB

The financial cost (accrued interest) of the loan by the European Investment Bank ends in 2009 following the completion of capital repayment in April 2009.

Loan from FORTIS bank

The outstanding amount to Fortis bank amounts to 405.8 MCHF at the end of 2010. The capital repayment will end in 2026.

Short-term bank loans and overdrafts

As mentioned in Table 19, short-term loans and bank overdrafts are estimated to amount to 150 MCHF at the end of 2010. The estimated short-term interests will amount to some 2.3 MCHF as shown in Table 15.

Loan from FIPOI

The FIPOI loans are interest-free, the capital repayment for the existing two FIPOI loans amounts to 880 kCHF per year. In addition, a further FIPOI loan was granted for the Building 40 extension (building 42). By the end of 2008, 1 MCHF was received, 4.5 MCHF will follow in 2009. The capital repayment of 226 kCHF per year for this new loan will start once the building construction is completed.