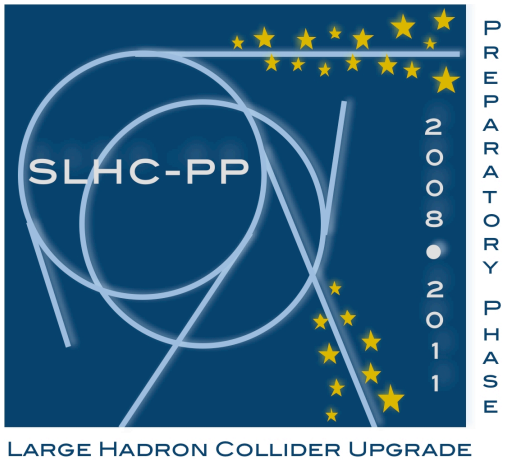


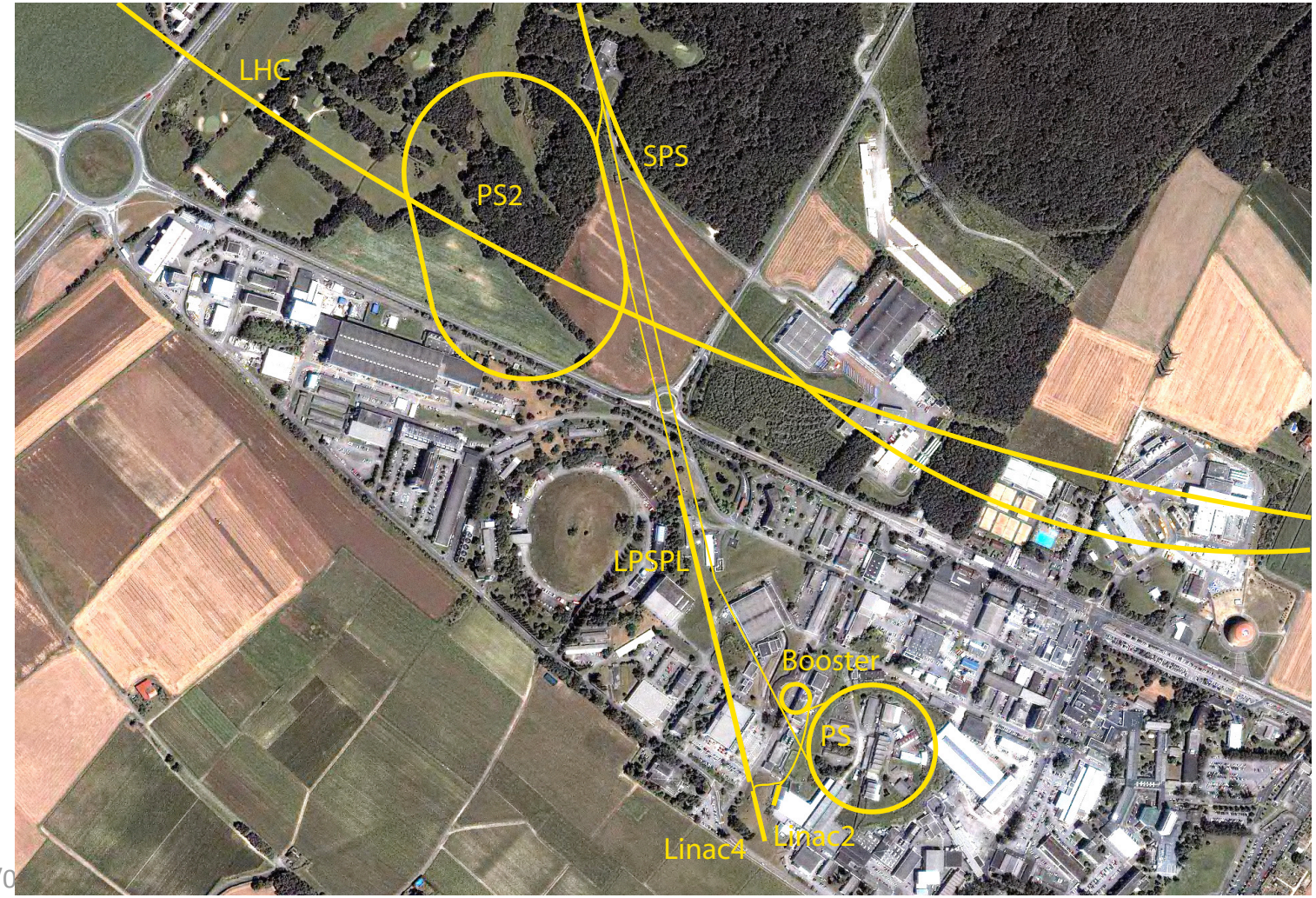
SLHC-PP annual meeting
Welcome and introduction

February 25th

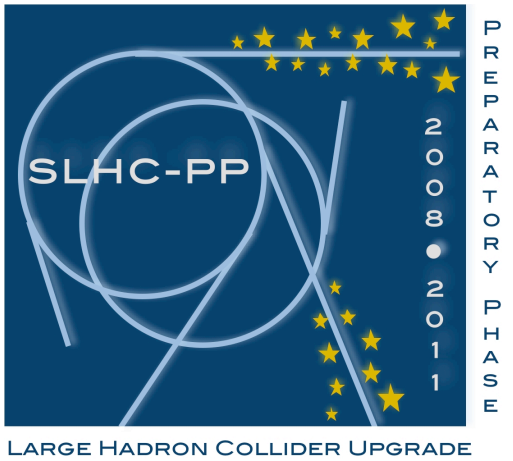
L. Linssen

The past year….

The most important is the technical progress !!!

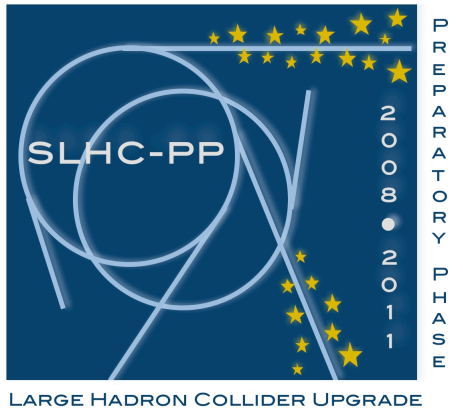


Some SLHC-PP dates …..



- Kick-off meeting April 8 + 9, 2008
- End April 2008:
  - Grant agreement signed by both EU and CERN
- End May 2008:
  - Grant agreement signed by all partners
- Beginning of June 2008:
  - First installment sent to all beneficiaries
- December 1st 2008:
  - Official accession of RWTH Aachen as beneficiary (in WP8)
- February 5th 2009:
- Received official EU approval for accession RWTH Aachen (member as of 1/12/2008)

Milestones



Number	Milestone title	Delivery month	Comment	Link
1.1	Kick-off meeting	M03	Presentations on SLHC-PP web site	Agenda
6.1	Qualification of magnet components	M08	Qualification document published	Report
3.1	Schedule for the R&D phase	M09	Schedule document	Report
6.2	Basic Magnet design	M10	Magnet design report	*Word Template*
1.2	First Annual SLHC-PP Meeting	M12	Presentations on SLHC-PP web site	Agenda
5.1	Compilation and evaluation of design parameters and details relevant for the assessment of radiological impact; Identification of critical parameters and potential design constraints	M12	Meeting with stakeholders in accelerator and experiments, to define an agreement on design parameters	*Word Template*

Deliverables

Number	Deliverable title	Nature	Delivery month	Link
1.2.1	SLHC-PP web-site operational (intranet + public pages)	O	M03	Report
3.1.1	Project management structure and review office for R&D phase in place	O, R	M06	Report
2.2.1	Functioning collaboration communication structure	O	M12	Word Template
2.2.2	Project web site linked to the technical databases: Machine layout database, hardware baseline database, project notes and reports	O	M12	Word Template
4.1.1	Project Structures for construction of systems and sub-systems	O, R	M12	Word Template
4.2.1	Personnel and working practices of the Technical Coordination unit in place	O, R	M12	Word Template
6.1.1	Basic design of the triplet	R	M12	Word Template
7.1.1	Finite element thermal study of the Linac 4 design source at the final duty factor	R	M12	Word Template
7.2.1	In depth characterisation of the two tuners plus cavities developed in the frame of the "HIPPI" JRA , FP6 (tuner/cavity characteristics)	R	M12	Word Template
8.1.1	Evaluation report on DC-DC conversion technologies	R	M12	Word Template
8.2.1	Evaluation report on generic serial powering studies and specification of serial powering components	R	M12	Word Template

SLHC-PP Public Pages Project

Work by Colin Barras

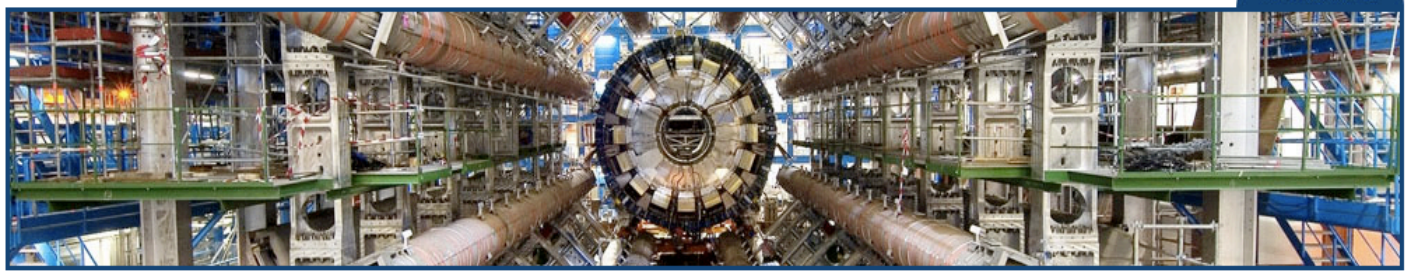
Science Writer

Background for General Public: Why, What, When?

SLHC-PP

Large Hadron Collider Upgrade: Preparatory Phase

Contact us



HOME | BACKGROUND | NEWS | UPGRADE WORK | PROJECT MEMBERS

INTRODUCTION | WHY UPGRADE? | WHAT'S NEW? | TIMELINE

The largest collider in the world

The Large Hadron Collider (LHC) started operations in September 2008. Deep underneath the Swiss and French countryside on the outskirts of Geneva, the collider is the largest and highest energy particle accelerator yet built.

It occupies a 27-kilometre-long circular tunnel, in which a series of state-of-the-art magnets guide and focus a clockwise and anticlockwise beam of protons - positively charged subatomic particles. The two beams are brought together at four points around the ring, at the heart of four particle detectors that analyse the debris from the collisions between the fast moving protons.

Those collisions occur at seven times the energy of any collisions ever observed before, which should help physicists learn more about the basic forces that have shaped our universe since the beginning of time and that will determine its fate.

In particular, particle physics experiments at the LHC are expected to increase our knowledge on the origin of mass, the formation of matter, matter-antimatter asymmetries, extra dimensions of space, microscopic black holes and dark matter in the universe.

LHC What makes the LHC unique is the energy of those impacts. Each beam

Technical Information for General Public

SLHC-PP

Large Hadron Collider Upgrade: Preparatory Phase

Contact us

HOME | BACKGROUND | NEWS | UPGRADE WORK | PROJECT MEMBERS

INTRODUCTION | SUPER-LHC | SUPER-ATLAS | CMS2 | RADIATION & SAFETY | NEW MAGNETS | NEW INJECTORS | POWER ISSUES

The "Super" LHC?

SLHC-PP comprises Coordinating, Support and Technical activities. The Coordinating activities within SLHC-PP play a central role for the organization of the new accelerator- and detector-upgrade collaborations, putting in place project structures and collaboration management tools, ultimately aiming for agreements on work-sharing and funding for the implementation phase. Support activities address upfront priority safety issues in the radiation protection domain. The Technical developments address the construction of prototypes of Nb-Ti high-field magnets with large aperture, the study of a new H- ion source, field stabilization in superconducting accelerating structures, and novel tracking detector power distribution.

Work Packages

WP8: Tracking Detector Power Distribution

converted to “Power Issues” >> *thanks to M.Weber*

Adding more pixels to the world's largest digital cameras

The innermost detectors on the ATLAS and CMS projects are rather like gigantic digital cameras. Each houses around 80 million square pixels and 6 million elongate rectangular pixels to deliver an incredibly detailed and crisp snapshot of the collisions occurring at their centres. But with ten times more collisions expected in each detector when the LHC is upgraded, even 86 million pixels won't be enough to photograph the resulting fireworks.

"It's an exaggeration, but you could almost imagine that with so many collisions all the pixels would light up at the same time," says Marc Weber at the Rutherford Appleton Laboratory. "We will need more pixels to see the collisions in detail."

But even cramming 86 million pixels into the inner detectors was difficult – bumping that total up to the 400 million needed for the upgraded detector will require some ingenious design work.

Each pixel is powered, and so in theory over four times as many more power cords must be threaded through the detector. But using more of the same relatively thick cables as are in the detector at the moment is not an option (see Figure 1). "We want to have pixel modules in that space, not cables," Weber says.

Two solutions

One way to save space is to increase the voltage running through the cables – a trick that has been used by scientists for well over a century. The power running through a cable is related to both the voltage and the current. It's possible to send the same amount of power through a cable by increasing the voltage and simultaneously lowering the current.

The advantage is that cable diameter is proportional to current, and so the high voltage cables can be thinner. When the cable reaches the pixel modules, a simple converter can step down the voltage and increase the current to the levels needed for the module.

Another approach is to completely change the way the pixels are powered. At the moment, each is fed by its own power supply. But for the SLHC, a few cables could each power a large number of pixels. "It's like the electric lights on a Christmas tree," Weber says. "Using that approach we could reduce the number of cables we need by a factor of almost twenty."

Environmental issues

But both methods carry their own problems. "These are the way things have been done for 100 years," says Weber (see Figure 2 - one of Nikola Tesla's US patents). "The reason why have we've

Fig. 1. The ATLAS SCT (semiconductor tracker) detector. The thick red cables on show feed the detector with half of its power - adding more will take up even more space. *Click to enlarge image*

UNITED STATES PATENT OFFICE.

NIKOLA TESLA, OF NEW YORK, N. Y.

METHOD OF AND APPARATUS FOR ELECTRICAL CONVERSION AND DISTRIBUTION.

SPECIFICATION forming part of Letters Patent No. 462,418, dated November 3, 1891.

Application filed February 4, 1891. Serial No. 380,182. (No model.)

To all whom it may concern:

Be it known that I, NIKOLA TESLA, a subject of the Emperor of Austria, from Smiljan, Lika, border country of Austria-Hungary, residing at New York, in the county and State of New York, have invented certain new and useful Improvements in Methods of and Apparatus for Electrical Conversion and Distribution, of which the following is a specification, reference being had to the drawings accompanying and forming a part of the same.

This invention is an improvement in methods of and apparatus for electrical conversion, designed for the better and more economical distribution and application of electrical energy for general useful purposes.

My invention is based on certain electrical phenomena which have been observed by eminent scientists and recognized as due to laws which have been in a measure demonstrated, but which, so far as I am aware, have not hitherto been utilized or applied with any practically useful results. Stated briefly, these phenomena are as follows: First, if a condenser or conductor possessing capacity be charged from a suitable generator and discharged through a circuit, the discharge each impulse, alternation, or oscillation of the current extremely small. To the many difficulties in the way of effecting this mechanically, as by means of rotating switches or interrupters, is perhaps due the failure to realize practically, at least to any marked degree, the advantages of which such a system is capable. To obviate these difficulties, I have in my present invention taken advantage of the fact above referred to, and which has been long recognized, that if a condenser or a conductor possessing capacity be charged from a suitable source and be discharged through a circuit the discharge under certain conditions, dependent on the capacity of the condenser or conductor, the self-induction and resistance of the discharging circuit, and the rate of supply and decay of the electrical energy, may be effected intermittently or in the form of oscillations of extremely small period.

Briefly stated in general terms, the plan which I pursue in carrying out my invention is as follows:

I employ a generator, preferably, of very high tension and capable of yielding either direct or alternating currents. This generator

Timescale

- Collection of content by **Colin Barras** via **phone interviews** (15 min talking + one feedback call)
  - WP leaders
  - Partners

- April: Content finished
- Mid May: Pages available to general public

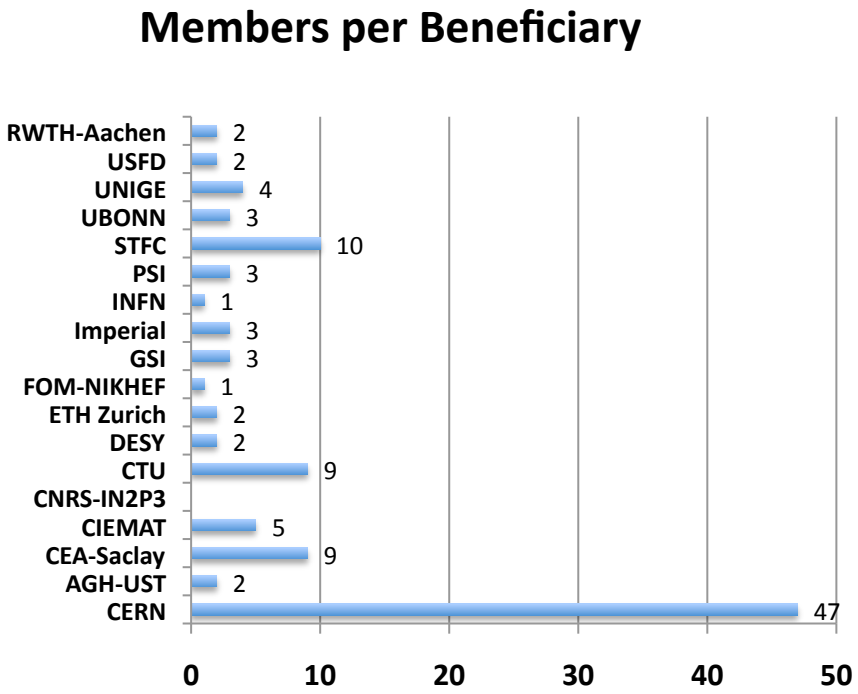
SLHC-PP Management Report

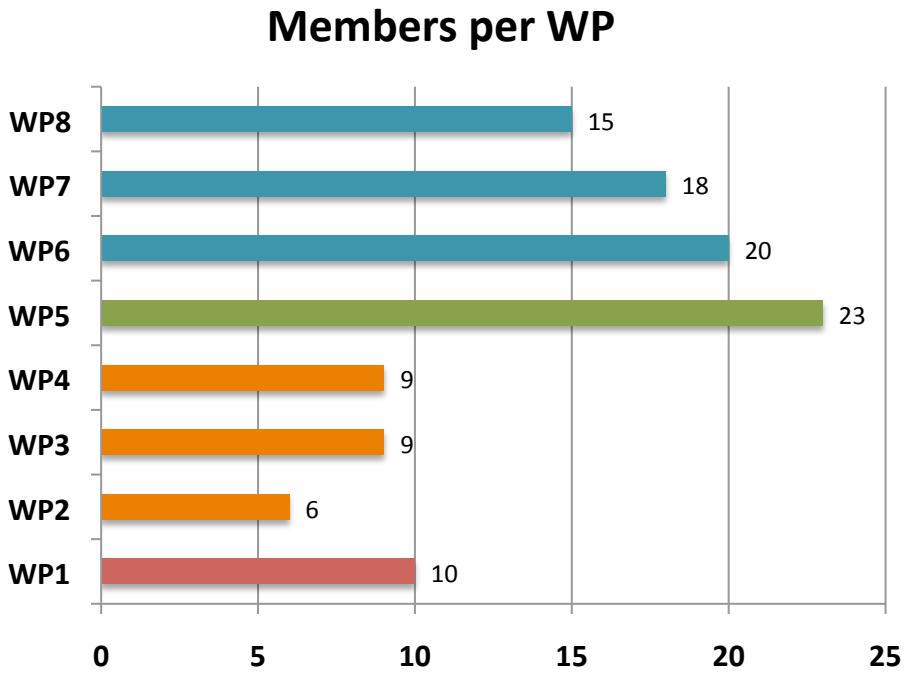
April 08 – January 09

M.Capeans, N.Knoors, C.Montagnier, K.Ross

SLHC-PP Membership

- Registered in PPT: 99
- CEA and CNRS do not report in PPT, but have provided estimates





Personnel Expenses
April 08 – Jan 09

PM from Worked Hours reported in PPT

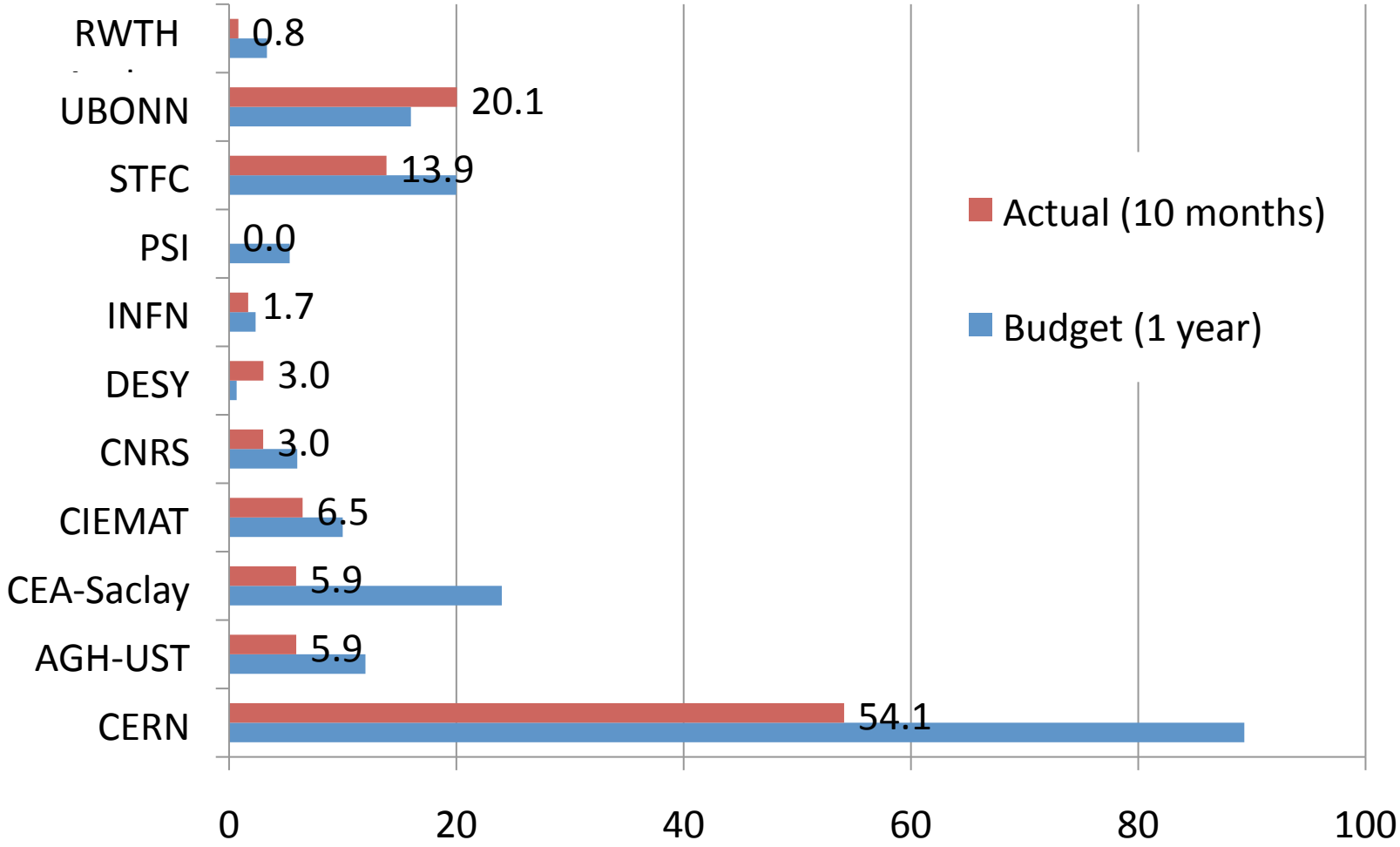
Assumption: flat spending profile
(year budget = total/3)

WP	P-M	P-M reported / P-M budgeted for Period1	P-M reported / P-M budgeted for whole Project
1	13.7	84%	28%
2	3.8	22%	7%
3	31.1	92%	30%
4	19.8	66%	22%
5	21	55%	18%
6	37	57%	19%
7	24	39%	13%
8	54.5	84%	28%
SUM	204.4	63% of Period1 budget	21% of whole budget

Full SLHC-PP project has 976 PM in Annex-I

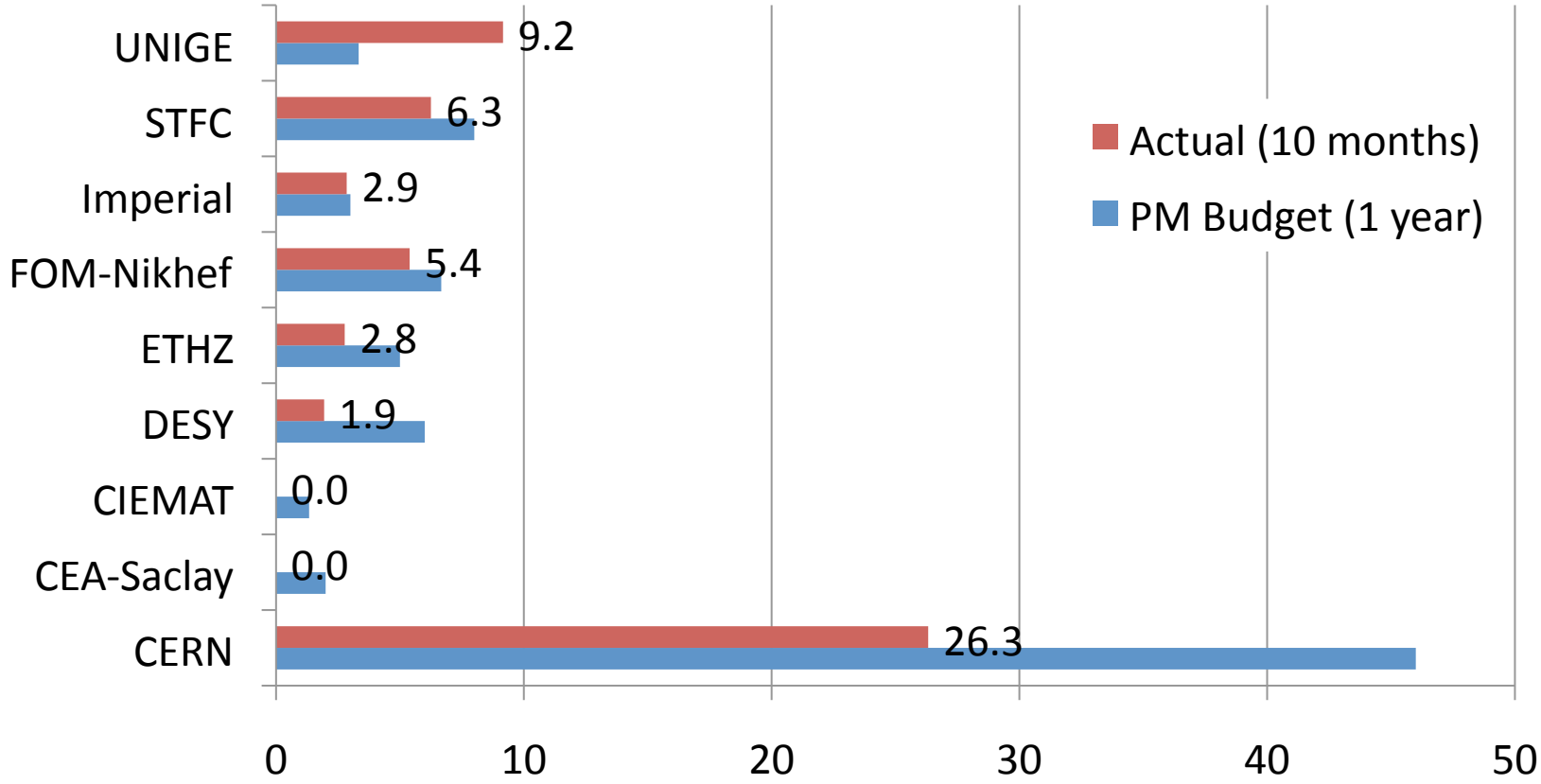
PM for RTD Activities (WP 6 ,7, 8)

April 08 – Jan 09



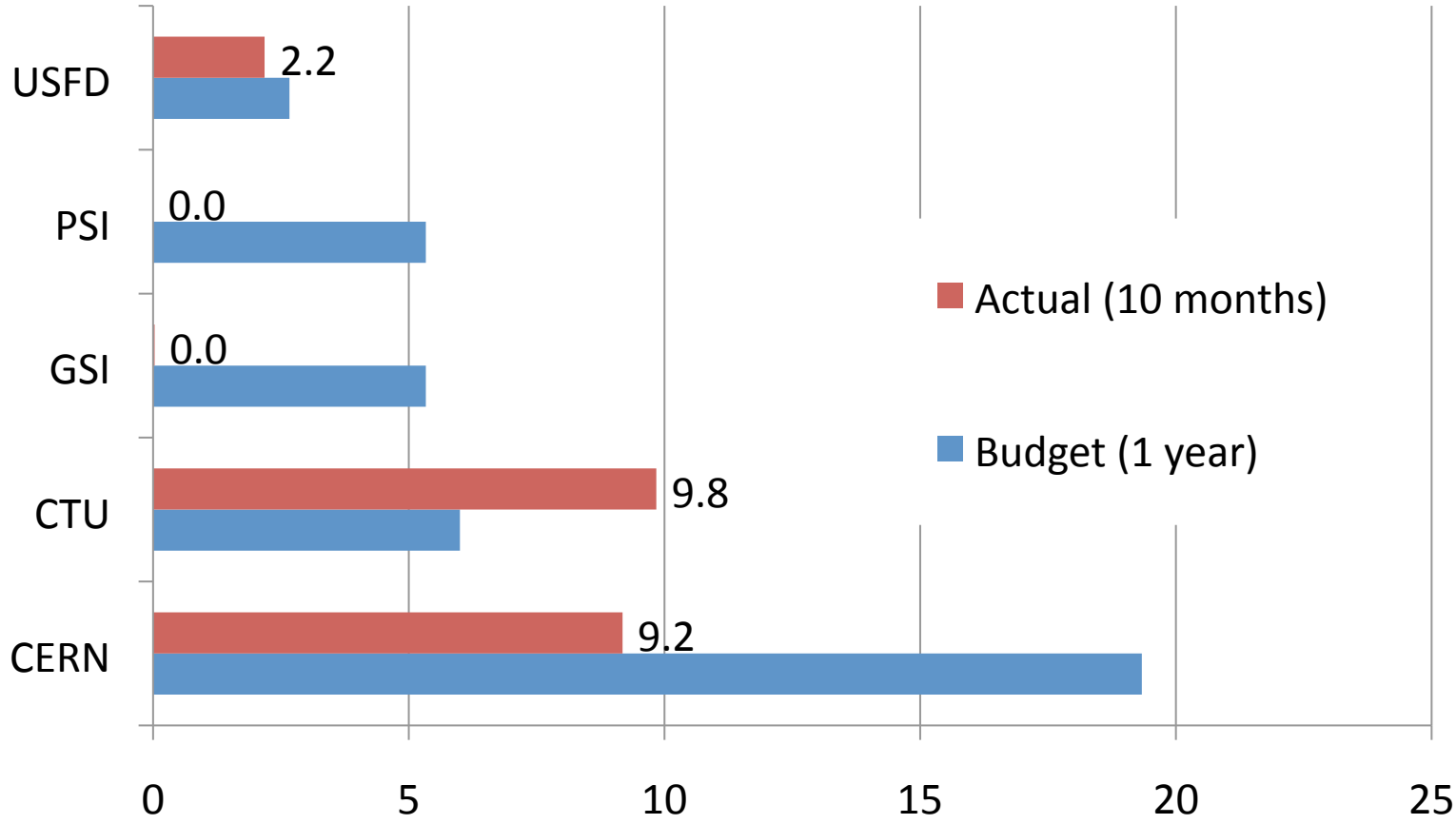
PM for Coordination Activities (WP 2, 3, 4)

April 08 – Jan 09



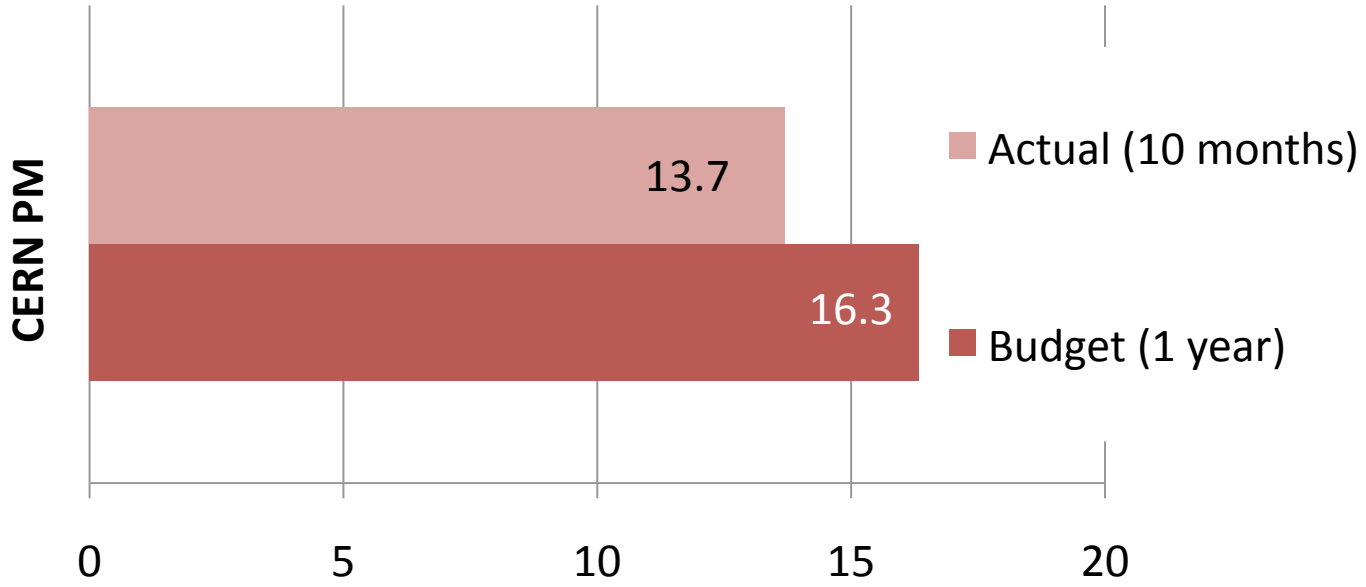
PM for Support Activities (WP5)

April 08 – Jan 09



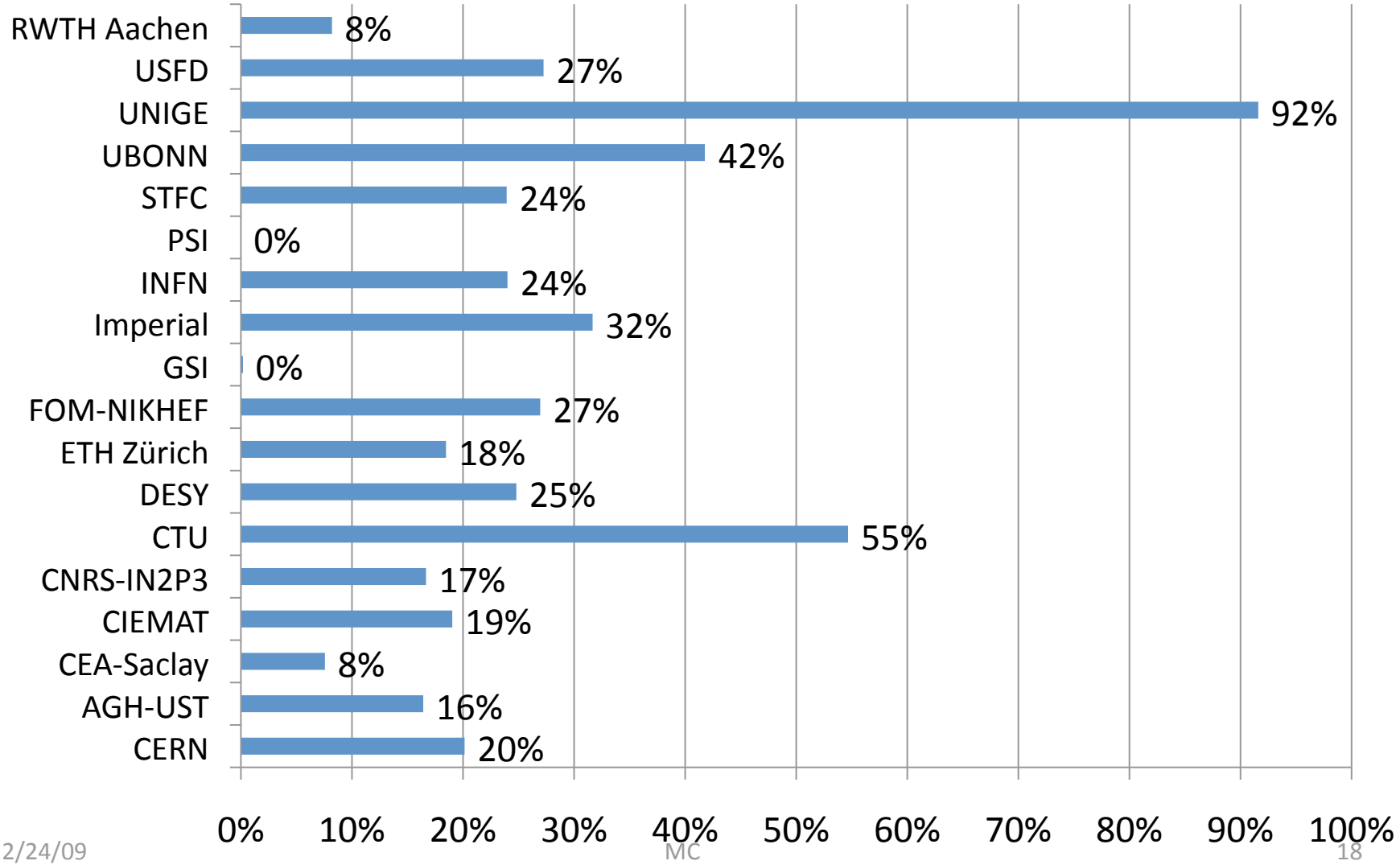
PM for Management Activities (WP1)

April 08 – Jan 09



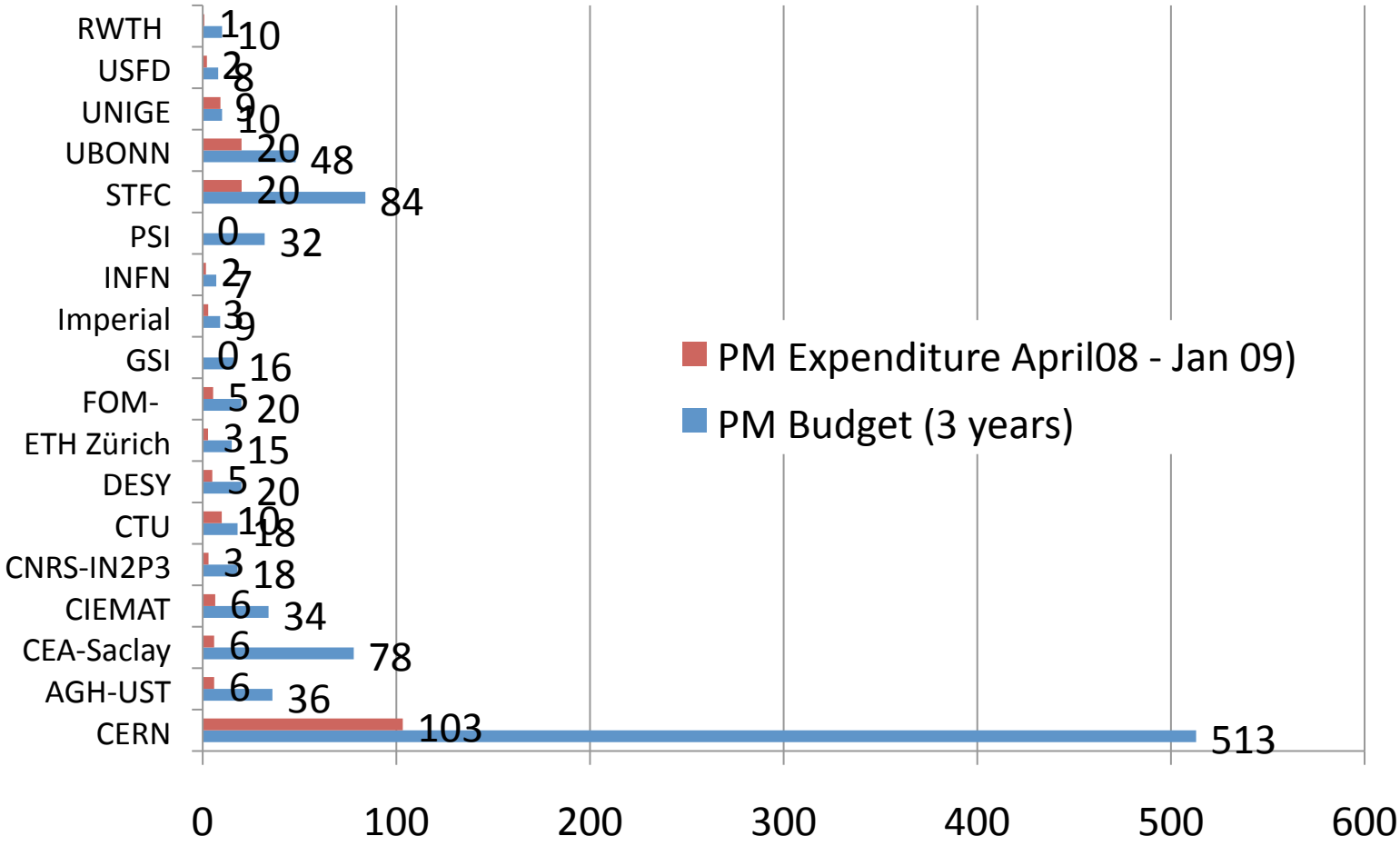
PM / Partner

Actual (10m) / Budget (3 y)



PM / Partner

Budget (3 y) VS Actual (10 m)



The annual meeting

Aim of the present annual meeting:

- Discuss progress of the 1st year and plans for the 2nd year
- Public SLHC outreach event (Thu morning)
- Preparation for the first official annual report
  - Presentations at the annual meeting form the seed material for the technical progress section of the annual report
  - Information session this afternoon at 17:30 hrs

Invitation

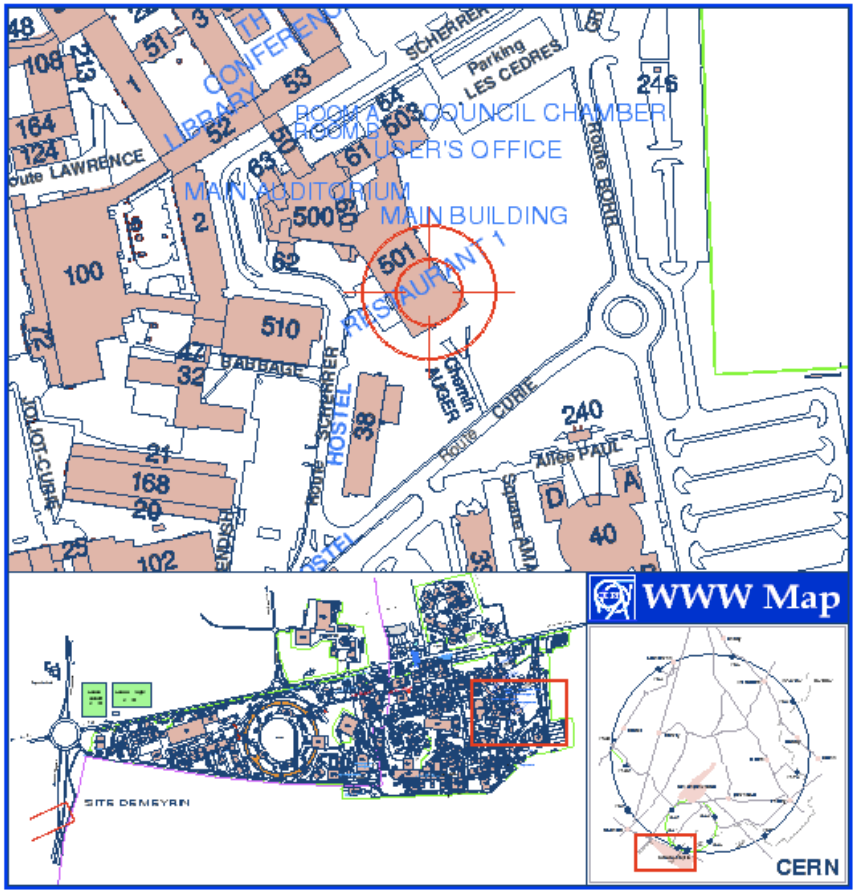
This evening 18:30 hrs

Drinks and snacks

In the glass box

All are welcome

…even those who forgot to register…



have a nice meeting !