



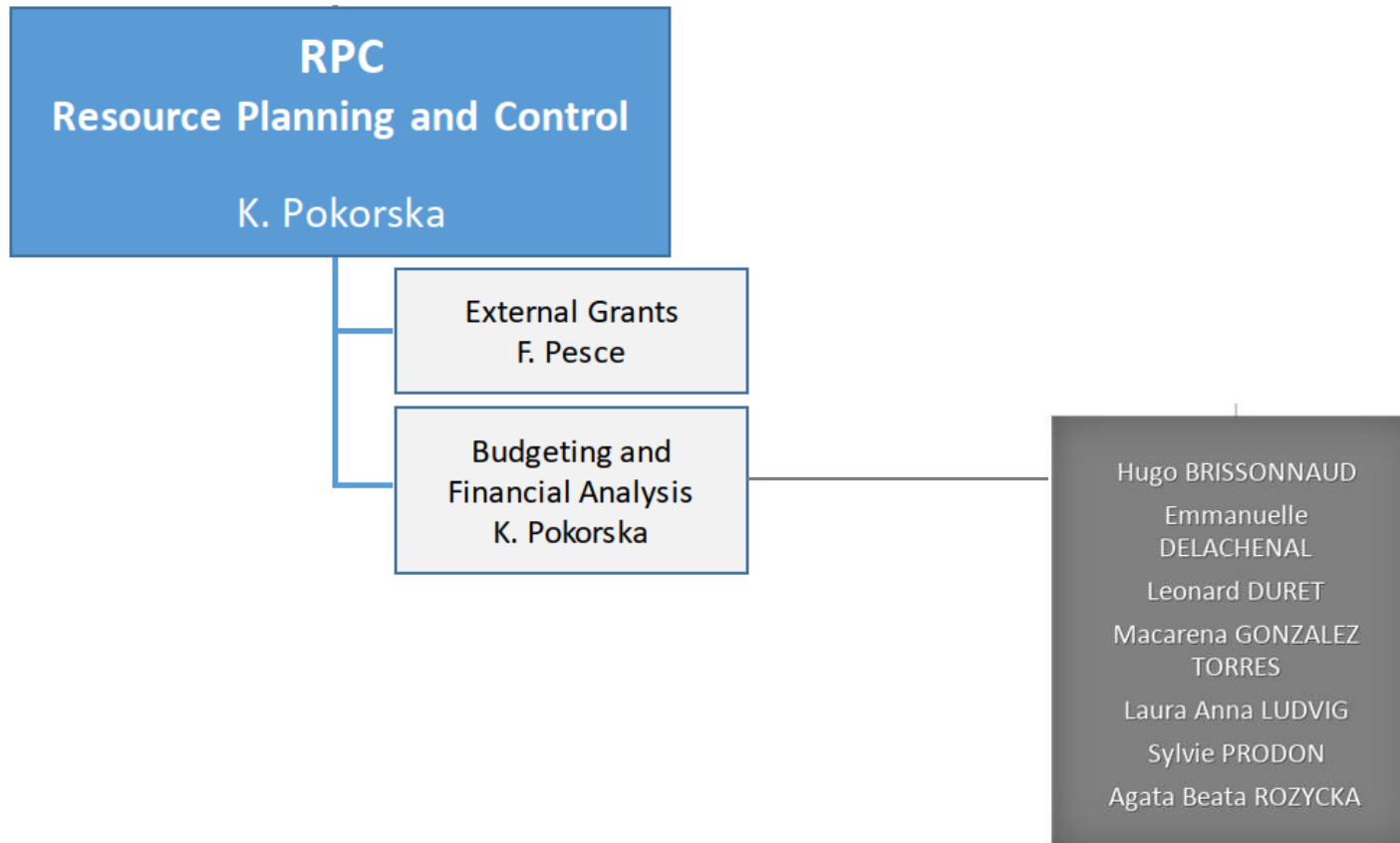
Overview of CERN planning, budgeting and controlling principles, process and its supporting information systems

Presentation to FAIR GSI

Kasia Pokorska, 26 November 2024

Presentation of the central planning unit

Group Resources Planning and Control in the Finance and Aministrative Processes department: FAP-RPC



General Context and Constraints (1)

AIM:

**to optimize the resources allocation
to BEST fulfil the Organization's mission.**

MAXIMUM OUTPUT with MINIMUM INPUT

Constraints:

- Limited resources
- Construction of HL-LHC within constant budget (no additional MS contributions)
- Aging infrastructure
- Compliance with Financial Rules & internal financial regulations

General Context and Constraints (2) - Resources challenges CERN is facing today

- **Recent economic context:**

- Difficulty for Member States to settle their contributions on time (strong CHF)
- Difficulty for research institutes to fulfil their contractual obligations towards various facilities / experiments at CERN
- COVID-19 and the Russian invasion of Ukraine
 - Two-digit inflation in most Member States, energy prices rising dramatically in 2022
 - Waiving of the Ukrainian contribution as an Associate Member States
 - Termination of the collaboration with Russian and Belorussian institutes
 - ➔ Translated in financial obligations taken over by CERN (HL-LHC project) and experiments (detectors upgrades)
- Almost “continuous” planning and forecasting exercise since 2020

- **CERN budget under pressure:**

- Negative materials indexation 2016-2017, 2021, 2025 (CHF appreciation, slower economic growth)
- Extremely high materials indexation 2023-2024, not compensated by the increase of the Member States contribution
 - ➔ The corridor principle limit the indexation to 2%, significant loss of the purchasing power for CERN despite one-of of additional contribution for 2023
 - ➔ CERN's duty to identify and propose various savings (e.g. reducing the operation time of accelerators, crisis levy by staff members, delaying consolidation of infrastructure, postponing projects)

General Context and Constraints (3) - Resources challenges CERN is facing today

- **Limited staff resources in departments**
 - 2666 “heads” at the end of 2023 (2615 FTEs in 2023)
- **Distribution (and constant re-allocation) of available and limited resources between**
 - Operation and consolidation of the existing accelerator complex
 - High-Luminosity upgrade of the LHC machine and detectors
 - Preparation for the future
 - Studies for future circular colliders, physics beyond colliders

Overview of the CERN planning cycle (1) – core planning documents: **MTP** and **Final Budget**

- **Medium Term Plan (MTP) including Draft Budget**

- Overall underlining strategy (objectives) for the next 5 years
 - 10-year projection for revenues and expenses
- Draft Budget for the next year in the current prices
- Targets for next budget year (to be measured against these)
- Submitted to the approval by the Council
- E.g. **MTP 2024**: covers planning period 2025-2029 and introduces Draft Budget for the year 2025

- **Final Budget**

- Implements
 - The approved indexation to the expenses and revenues budget
 - The allowed transfers of unspent budget between years (carry forward, carry back, reprofiling)
- Includes the information on the Probable Revenues and Expenses for the current year
- For information only, no formal vote required from the Council

Overview of the CERN planning cycle (2) – core reporting document: APR

- **Annual Progress Report (APR)**

- **Quantitative** aspect:

- Compares the actual amounts (budget out-turn) with the budgeted values by activity, showing the achievements
- Dedicated section on KPIs
 - measuring various outputs: scientific, administrative (human resources, procurement), outreach, safety, environment

- **Qualitative** aspect:

- Explains the numerical variations
- “Narrative” reporting on the targets / objectives set in the Final Budget

- **Joint effort** of multiple actors

- Accounting for the actual amounts
- DHs, DPOs, Project Leaders for explanations

- **Revised Budget**

- Part of the MTP

- Eg. MTP 2024 contains Revised 2024 Budget

- Published as a separate document occasionally (e.g. in 2009 as a result of the LHC incident in September 2008)

Overview of the CERN planning cycle (3) – auxiliary documents: CVI and “Scale”

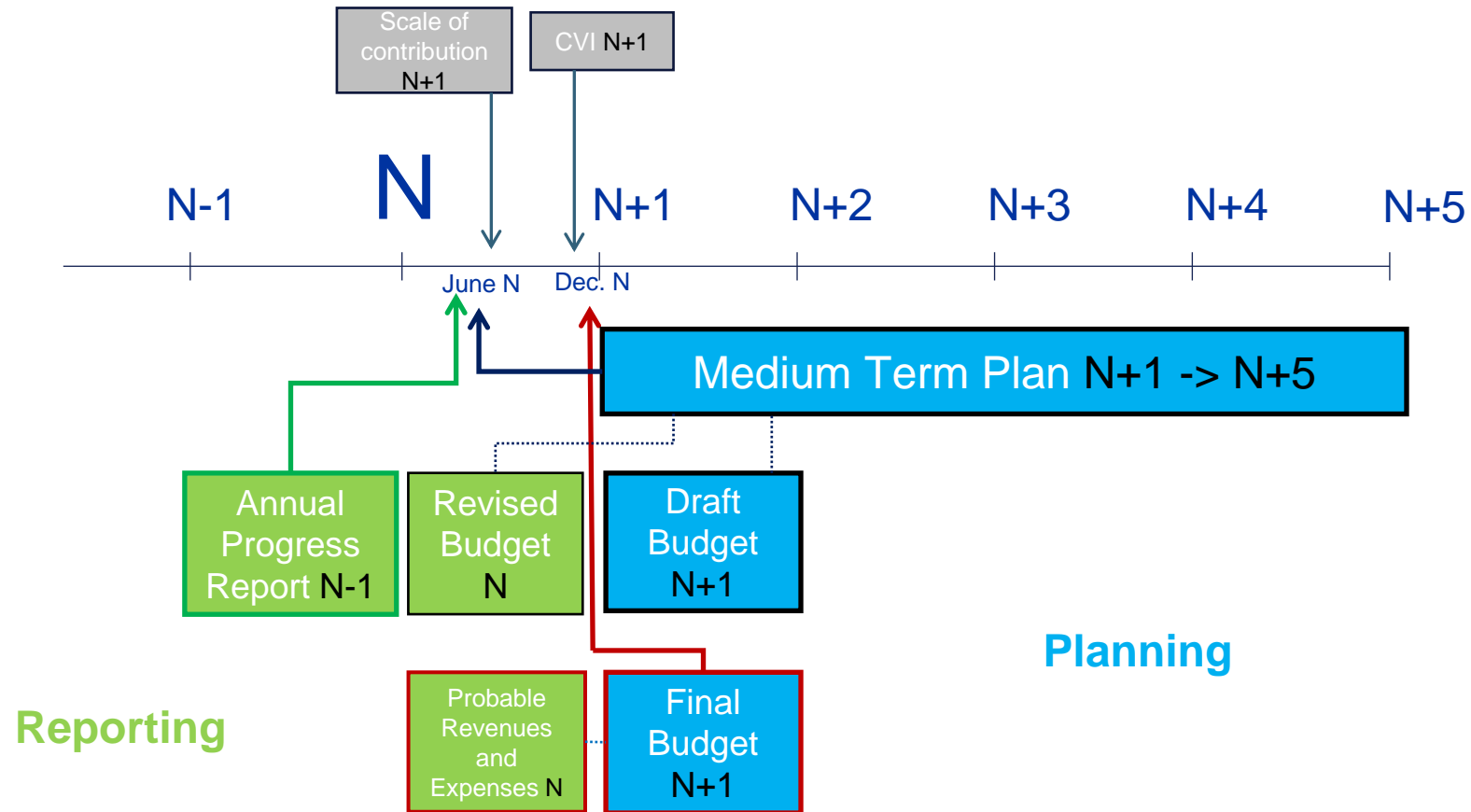
- **Cost Variation Index (CVI)**

- Voted in December
- **Personnel** part: to protect basic salaries and stipends from the erosion of purchasing power resulting from the increase in the cost of living
 - No “negative” indexation but keep the memory
- **Materials** part: to align the expenses budget to the inflation / deflation tendency, corrected by the variation in exchange rate between national currencies and Swiss franc
- **Revenue** part, only Member States’ and Associate Member States’ contributions are indexed, the “corridor” principle

- **Scale of Member States’ Contributions**

- Voted in June
 - The contributions are expressed in the current year prices
- Indexation applied in December
 - Corridor principle: Member States’ contribution are indexed in between 0% and 2%

Overview of the CERN planning cycle (6) - **timeline**



Resources planning @CERN (1) – actions of different governing bodies

- **Council** approves guidelines on **OBJECTIVES** and **TARGETS** for each scientific programme and project
 - Not driven by internal CERN organisation or type of resources
- **Feedback by the Scientific Policy Committee** on the scientific programs
 - First physics potential
 - Financial affordability considered as well
- **Approval of experiments/new initiatives via the Research Board**
- **Vision of the Director General** translated in the **Mid/Long Term Plan**
 - Balance between scientific interest and available resources
 - Resources allocation is based on a Personnel + Materials policy

Resources planning @CERN (2) - Principles

- **Financial Rules and Regulations**

- Document approved by Council
- Last revision to accommodate latest practices in June 2024: CERN/FC/6786/RA/Rev.
- Stipulate (Article 16):

CERN's accounts shall be drawn up in accordance with the International Public Sector Accounting Standards (IPSAS).

These standards and the way in which they are implemented shall be explained in the notes attached to the annual Financial Statements.

- Planning and budget: [Section 2 - Article 5 to 9](#)

- **IPSAS implementation**

- Since 2007 in the financial statements
- Budget follows the “modified” cash principle (accruals based) with some non-cash elements (e.g. variation of the paid leave)

Resources planning @CERN (3) - Revenues

- **Member States' contribution**
 - ~90% of the whole revenues
- **Contributions from Associate Member States**
 - Transition phase, a percentage of the full amount, minimum 1 MCHF
 - Ramping up to 100% over a few years
- **Participation in EU projects**
- **In-kind and cash contributions to specific projects and facilities, from**
 - Countries (e.g. US for HL-LHC)
 - Institutes (e.g. ITER, FAIR)
 - Private Industry (e.g. Siemens, Oracle, Micron for OpenLab initiative)
 - Private Donors (e.g. for Science Gateway, Artificial Intelligence and Quantum Computing technics for detectors)

(in MCHF, rounded off)	2023 Probable Revenues (2023 prices)	Final 2024 Budget (2024 prices)
REVENUES	1 485.9	1 408.6
Member States' contributions	1 199.0	1 221.9
Associate Member States' contributions	31.4	33.5
Additional contributions from Member and Associate Member States	73.8	
Special contributions to HL-LHC	11.7	18.5
EU contributions	9.4	9.1
Additional contributions	11.5	14.2
<i>HFM, AWAKE, FAIR, Hostlab</i>	6.1	11.7
<i>External contributions to the Neutrino Platform (Swiss, INFN, in-kind)</i>	5.4	2.5
Personnel paid from third-party accounts	18.8	19.7
Personnel on paid special leave	0.0	
Internal taxation	37.4	38.0
Knowledge transfer	4.0	2.9
Other revenues	88.8	50.8
<i>Sales and miscellaneous</i>	27.5	27.9
<i>SCOAP3 revenues</i>	8.1	8.9
<i>OpenLab revenues</i>	1.2	0.6
<i>Donations</i>	34.2	
<i>Financial revenues</i>	8.5	6.0
<i>In-kind ¹</i>	1.4	1.4
<i>Housing fund</i>	6.0	6.0
<i>FIPOI revenues</i>	1.7	

Resources planning @CERN (4) – Member States' contributions in 2024

Member States' Contributions

Country	%	In CHF, 2024 prices
Austria	2.24036	27 376 050
Belgium	2.78676	34 052 750
Bulgaria	0.37481	4 580 000
Czech Republic	1.18411	14 469 200
Denmark	1.86020	22 730 650
Finland	1.35368	16 541 250
France	13.43380	164 153 900
Germany	21.13409	258 247 250
Greece	0.99685	12 181 000
Hungary	0.74708	9 128 950
Israel	2.22672	27 209 350
Italy	9.87774	120 700 800
Netherlands	4.68872	57 293 700
Norway	2.19487	26 820 150
Poland	3.12590	38 196 850
Portugal	1.10606	13 515 450
Romania	1.32351	16 172 600
Serbia	0.28191	3 444 800
Slovakia	0.53632	6 553 550
Spain	7.01313	85 696 800
Sweden	2.66701	32 589 450
Switzerland	3.75187	45 845 900
United Kingdom	15.09452	184 447 050
Total	100%	1 221 947 450

Associate Member States' Contributions

Associate Member States in the pre-stage to Membership	
Country	In CHF, 2024 prices
Cyprus	1 116 000
Estonia	1 462 050
Slovenia	2 325 100
Total	4 903 150

Member States pay as a function of their economy size expressed in CHF

- Net National Income at factor cost (not GDP)

Indexation of contributions decided annually according to the defined principle

Associate Member States	
Country	In CHF, 2024 prices
Croatia	1 000 000
India	17 709 200
Latvia	1 066 250
Lithuania	1 000 000
Pakistan	2 018 650
Türkiye	4 770 750
Ukraine	1 045 600
Total	28 610 450

Resources planning @CERN (4) – Expenses in general

- Expenses are broken down by

- Activity / Project
- Organic Unit (Department)
- Funding
- Nature / Account

=> Impact IPSAS

- Accrual accounting

The expenses are recognized when an actual / physical delivery takes place and not the payment!

(in MCHF, rounded off)	2023 Probable Expenses (2023 prices)	Final 2024 Budget (2024 prices)
EXPENSES	1 355.3	1 457.0
Running of scientific programmes and support	1 071.2	1 098.8
Scientific programmes	469.2	506.3
Accelerator programme	276.8	309.3
Experiments and research programme	192.3	197.0
Infrastructure and services	602.0	592.5
General infrastructure and services (incl. admin, external relations, safety)	312.4	273.1
Site facilities (incl. infrastructure consolidation, buildings and renovation)	70.4	88.3
Centralised expenses	219.2	231.1
Centralised personnel expenses	38.2	37.8
Internal taxation	37.4	38.0
Internal mobility, pers. on paid special leave or paid from third-party accounts	18.9	20.1
Energy, water, helium and nitrogen, insurance and postal charges, miscellaneous	116.4	132.7
Interest, bank and financial expenses, in-kind ¹	8.3	2.6
Scientific projects	284.1	358.1
LHC upgrades	190.1	232.8
HL-LHC upgrade	133.3	160.1
LHC detector upgrades (Phase-1) and consolidation	1.0	3.7
LHC detector upgrades (Phase-2) and R&D	55.8	69.0
Future colliders studies	26.2	37.6
Linear collider	3.9	4.2
Future Circular Collider	19.8	30.0
Muon colliders	2.5	3.4
Accelerator technologies and R&D	24.5	41.6
R&D for future detectors	9.3	11.7
Scientific diversity projects	34.1	34.4
Neutrino Platform	26.2	26.7
Physics Beyond Colliders	4.0	4.3
EU-supported computing R&D, support for external facilities	3.9	3.4
BALANCE		
Annual balance	130.7	-48.3
Recapitalisation Pension Fund	-60.0	-60.0
Annual balance allocated to budget deficit	70.7	-108.3
-Cumulative balance (at 31/12 of the year) ²- - 292.9	-222.2	-330.5

Resources planning @CERN (5) – Personnel

- **Employed Member of Personnel – staff category**
 - Budgeted at standard cost
 - An overhead factor calculated at the beginning of each year
- **Carry-forward**
 - Unspent budget can be carried to the next year only to cover the existing commitments
- **Conversion from Limited Duration contract to Indefinite Contract (LD->IC)**
 - Impact on the budget
- **Advancement exercise**
 - Current career structure limits the increase of personnel cost (salary increase + performance payment)
 - Built in the budget, around 1.6% per year
 - Compensated by expensive departures

(in kCHF, rounded off)

Nature	2023 Probable Expenses	Final 2024 Budget
	(2023 prices)	(2024 prices)
	(a)	(b)
Staff members ¹	533 475	550 620
Basic salaries (incl Saved Leave)	343 600	357 950
Basic salaries	354 500	359 780
Crisis levy	-9 015	
Performance payment (non-pensionable)	4 750	4 885
Contribution to saved leave schemes	-6 635	-6 715
Allowances	69 145	70 155
Non-resident allowances / International indemnities	18 490	18 760
Family and child allowances	26 415	26 695
Special allowances	3 380	3 430
Overtime	2 390	2 425
Various allowances	18 470	18 845
Social contributions	120 730	122 515
Pension Fund	92 490	93 855
Health Insurance	28 240	28 660
Centralised personnel budget	75 570	75 820
Centralised personnel expenses	38 160	37 845
Installation, recruitment and termination of contracts	9 100	8 595
<i>Installation and removal costs</i>	1 850	1 610
<i>Termination allowances</i>	7 250	6 985
Additional periods of membership in the Pension Fund for shift work		
Contribution to health insurance for pensioners incl. long-term care	29 060	29 250
<i>Contribution to health insurance for pensioners</i>	26 325	26 500
<i>Contribution to long term care for pensioners</i>	2 735	2 750
Internal taxation	37 410	37 975
TOTAL PERSONNEL	609 045	626 440

Resources planning @CERN (6) – Materials

- **Various categories, including**

- Workforce:
 - Employed Members of Personnel – GRADuate category, “soft” ceiling 95 MCHF
 - Associated Members of Personnel (MPA)
- Industrial services
- Utilities: energy, helium & nitrogen (~10% of the budget)

- **Carry forward of unspent budget**

- Recurrent yearly activities – none, only in the limit of committed amounts
- Multi-annual activities with earmarked funding
 - Unspent budget can be carried forward to the next year without limits
 - If project is advancing faster, funds can be also carried back from future years without limits.

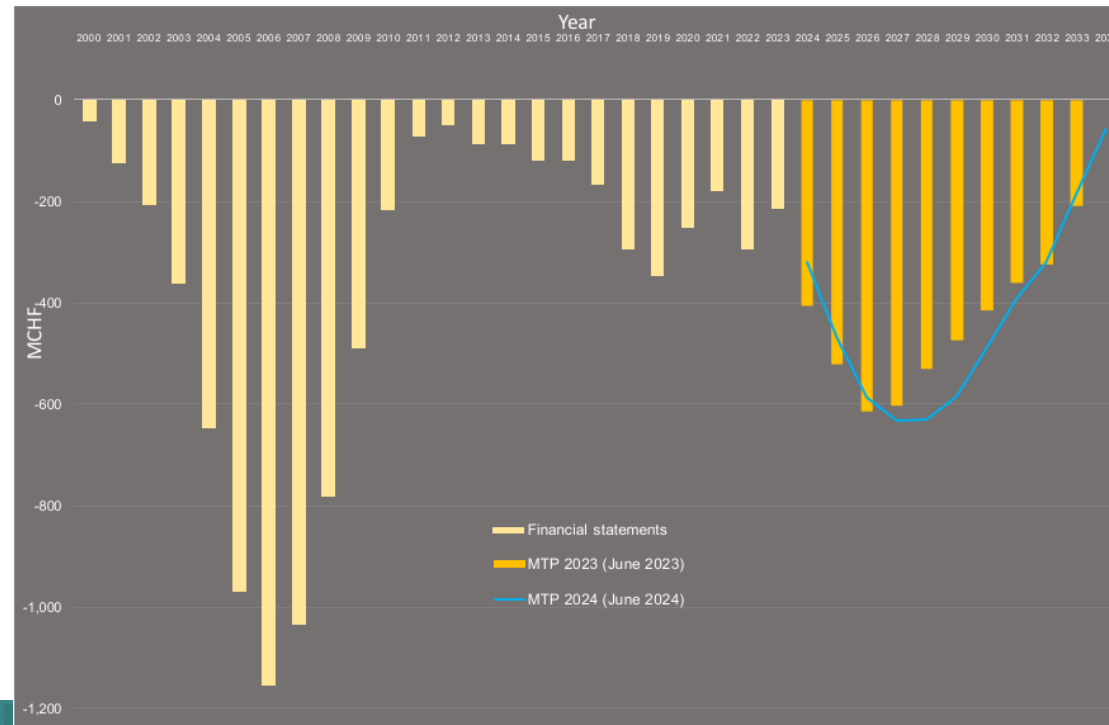
(in kCHF, rounded off)

Nature	2023 Probable Expenses	Final 2024 Budget
	(2023 prices)	(2024 prices)
	(a)	(b)
Materials expenses	738 115	828 130
Goods, consumables and supplies	333 410	414 470
Industrial services	118 160	124 245
Service contracts	113 115	118 830
Temporary labour	5 045	5 415
Electricity, heating gas and water	90 355	100 045
Helium and nitrogen	3 540	4 030
Fellows and graduates	97 850	95 420
Associated members of the personnel	36 280	30 840
Other overheads	53 230	53 360
Consultancy	16 795	17 015
Contributions to collaborations	4 275	4 275
Miscellaneous ¹	32 160	32 070
Insurance	5 290	5 720

Resources planning @CERN (7) – deficit, debts, and financial costs

- No short-term debts
- Long-term debts
 - FIPOI: 0% interest loan for buildings
- Cumulative budget deficit
 - -212.6 MCHF at the end of 2023
 - Regularly reported to the Council

(in MCHF, rounded off)		2023 Out-Turn
		(2023 prices)
		(b)
BALANCE		
Annual balance		140.2
Capital repayment allocated to the budget (FIPOI 1, 2 and 3, debt restructuring)		-60.0
Recapitalisation Pension Fund		80.2
Annual balance allocated to budget deficit		-292.9
-Cumulative balance²-	- 292.9	-212.6



Resources controlling/monitoring @CERN (1) – staff and graduates

- **Staff**

- For each post opening for limited duration contract
 - Verification whether within FTEs limit
 - Check the implication on cost
- LD to IC exercise
 - Budgetary consequences
- Advancement exercise
 - Monitor the cost
- Real cost versus standard
 - Follow-up on quarterly basis
 - Readjustment if needed

- **Graduates**

- Follow up of the commitments (in CHF) versus budget
- Regular reporting on the actual spending

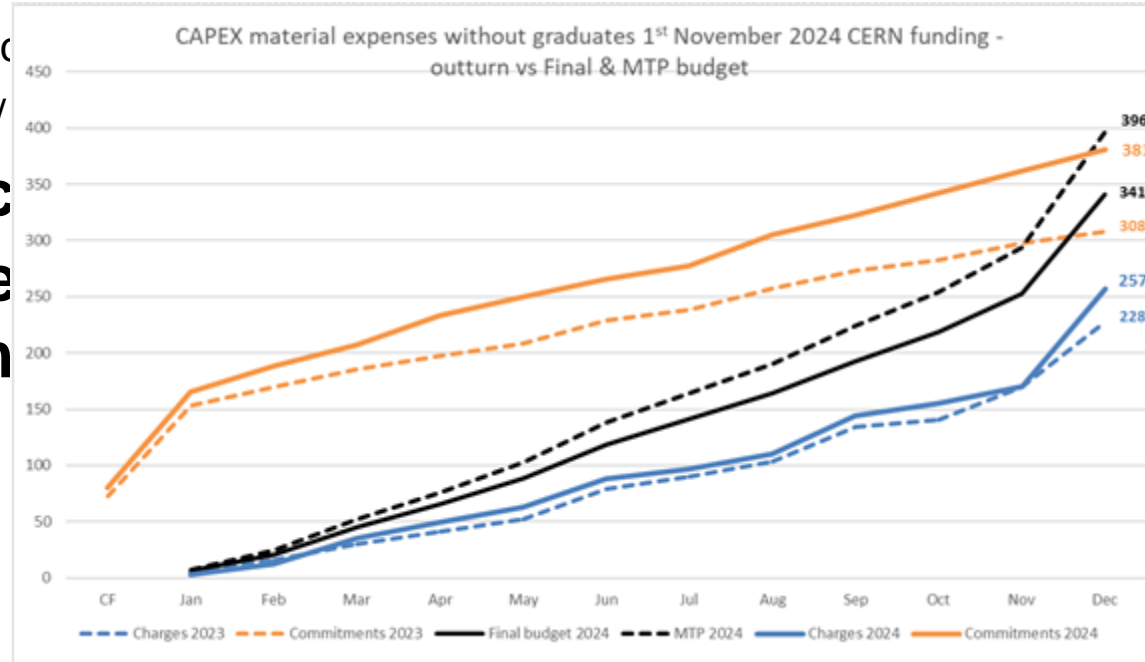
Resources controlling/monitoring @CERN (2) - Materials

- **Sophisticated budget control structure set up in Cegid**

- Different criteria
 - Per department / project
 - All extra commitments /

- **Projects of significant**

- **Internal monthly re expenses and com**



AP-RPC for approval

Tools (1) – planning: Activity Planning Tool APT

			2024			2025		
			PERSONNEL	MATERIALS	2024 Total	PERSONNEL	MATERIALS	2025 Total
CERN-PPA	ACC-PROG	Target A	19,143	45,950	65,093	20,325	49,040	69,365
		APT	19,922	45,923	65,845	21,069	53,532	74,602
		A-B	-779	27	-752	-744	-4,492	-5,237
	EXP-PROG	Target A	2,671		2,671	2,863		2,863
		APT	2,516		2,516	2,697		2,697
		A-B	155		155	166		166
	INFS-PROG	Target A	31,815	26,804	58,619	32,225	25,480	57,705
		APT	31,719	24,158	55,877	32,441	23,321	55,762
		A-B	96	2,646	2,742	-216	2,159	1,943
	PROJ-PROG	Target A	10,066	34,652	44,718	8,707	24,656	33,363
		APT	10,041	35,719	45,759	8,879	25,956	34,834
		A-B	25	-1,067	-1,041	-172	-1,300	-1,471

- **Top-down approach:**
 - Management decision
 - Implemented in budget / target figures
- **Bottom-up approach**
 - Group / Project leader requests (“APT”)
 - Consolidated into departmental proposals
- **Arbitration and approval during the MTP preparation**

Tools (2) – staff forecast: Staff Monitoring Tool SMT

- **SMT allows to**
 - Simulate number of FTEs
 - Calculate the corresponding cost
- **Deterministic tool**
 - All events are expressed with a probability
- **Using different scenarios and hypothesis**
 - All Limited Duration (LD) leave
 - All LD stay
 - Various retirements / advancement / replacement models
 - Different LD to Indefinite Contract ratio
 - Etc.

		2024	2025	2026	2027	2028	2029	<i>Grand Total</i>
FAP	FAP-ACC	21.18	21.30	21.30	21.26	21.20	21.20	127.43
	FAP-BC	38.00	39.40	39.40	39.40	39.40	39.40	235.00
	FAP-DHO	6.00	6.00	6.00	6.00	6.00	5.99	35.99
	FAP-RPC	11.90	11.90	11.90	11.90	11.90	11.90	71.40
FAP Total		77.08	78.60	78.60	78.56	78.50	78.49	469.82
Grand Total		77.08	78.60	78.60	78.56	78.50	78.49	469.82

Tools (3) – controlling and reporting: CERN Expenses Tracking CET (Cegid)

CET Summaries

Last CET Data Extraction: 20 Mar 2024, bookclosed for November (Stores: January).

Date: 20 Mar 2024

Query: Category of Accounts Materiel and Project HL and Time Period This Year + Carry Over

	Charged to Budget Code (CHF)	Annual Commitment (CHF)	Annual Open Commitment (CHF)	Payment Budget (CHF)	Pipeline (CHF)
ATS	240 714.98	1 337 593.67	1 096 878.69	0.00	81 133.98
BE	645 032.12	2 699 548.54	2 054 516.42	0.00	907 681.04
EN	1 487 468.00	15 724 189.66	14 236 721.66	0.00	337 459.14
IT	8 190.72	35 269.69	27 078.97	0.00	0.00
SCE	65 300.27	743 909.79	678 609.52	0.00	361 000.00
SY	1 610 374.64	32 476 466.48	30 866 091.84	0.00	2 566 918.08
TE	10 856 492.70	98 236 194.58	87 379 701.88	0.00	1 925 532.33
Grand Total:	14 913 573.43	151 253 172.41	136 339 598.98	0.00	6 179 724.57

Interactions with other services

Departmental planning officers and Project Leaders

- Consolidation of bottom-up budgetary requests
- Implementation of top-down budget decision

General and Personnel Accounting

- Close collaboration on the Annual Progress Report
- Establishing of the common processes, understanding, interpretation of accounting rules and standards

Procurement

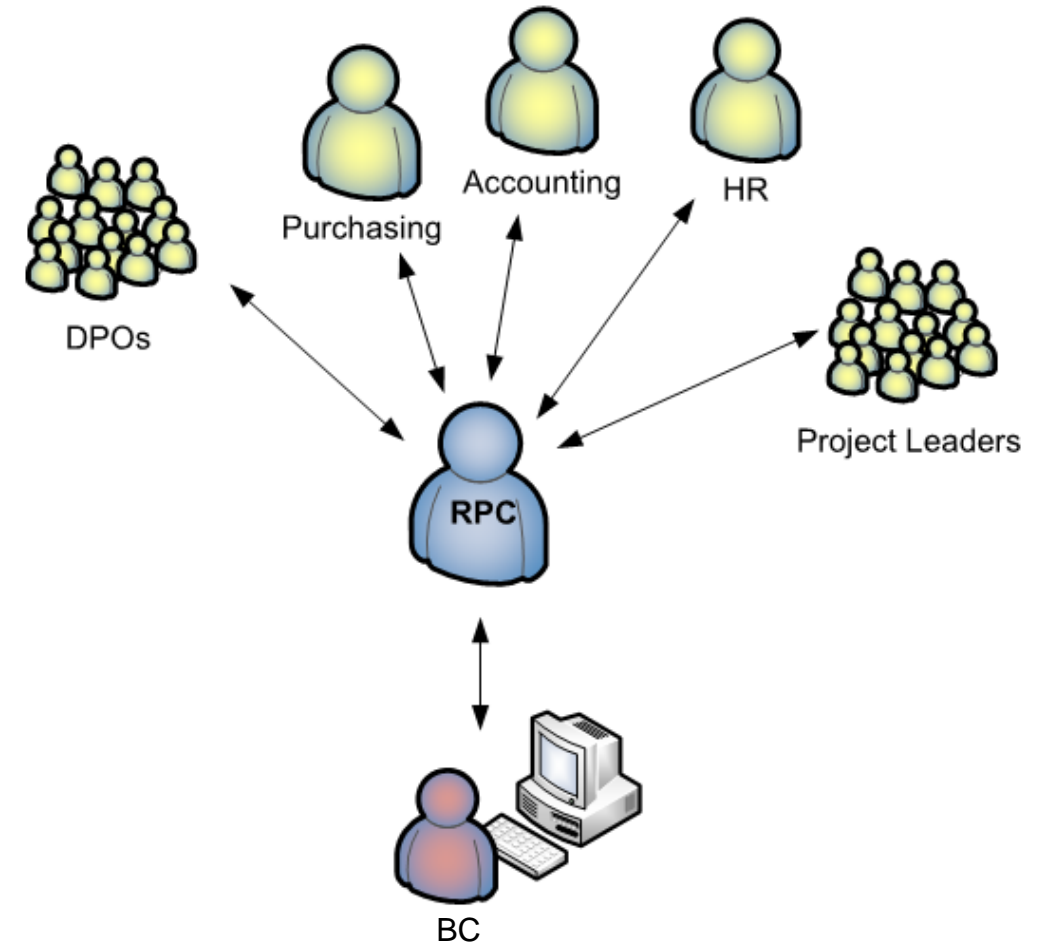
- Contract adjudications
- Estimation of Industrial Services

Human Resources

- Openings and extensions of posts within FTE limit
- Budgetary impact of the LD to IC exercise
- Advancement exercise

Business computing group

- Interface to administrative tools: APT, SMT, CET / Cegid, HRT, EDH
- Working groups on possible enhancements to the existing applications





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