

TE-VSC PLAN Activities Overview

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LS2 DAYS

7-8 NOVEMBER 2016

<http://indico.cern.ch/event/564604/>

Overview

- Known activities not or not properly defined in PLAN:
 - LHC Experiments, LHC beam vacuum and HL-LHC
 - cPS, SPS and Projects
- TE-VSC activities in PLAN as:
 - Coordinator
 - Contributors
- Overview of resources
- Summary & radiological consideration

Known activities impacting TE-VSC
not or not well defined in PLAN:

LHC Experiments
LHC Beam Vacuum
HL-LHC

LHC Experiments



1. New beryllium beam pipes with new contract follow up, partial production of Aluminium chambers at CERN with outside final assembly. Vacuum validation, chemical cleaning and NEG coating. Full layout upgrade of the others beam pipes: Heavy involvement of EN-MME.

Plan activity was created (by **TE-VSC as coordinator**) but not exhaustive:
PLAN 10315

2. **EYETS2016 and YETS2017** routine activities connected with detectors opening.
Nothing in PLAN



1. Upgrade of injection line for SMOG. New calibrated gauge for SMOG system. Integration to VSC of the VELO control system. Upgrade of layout drawings. Vacuum validation of VELO system. Chemical etching of new VELO RF foils. PLAN Activity 'VELO Upgrade - 10317' was created (by **TE-VSC as coordinator**)

2. **EYETS2016 and YETS2017** routine activities: Nothing in PLAN

LHC Experiments



1. Preparation phase: production, chemical cleaning, NEG coating and validation of IP beryllium chambers and RB24 upgrade. Conception and production of new bake out system.
2. Some double activities declared in PLAN 10969 – 10281 and some missing: to be revisited



1. New VC1AP chamber with annular ion pump. Upgrade of the VC1T remote actuated support system. Installation of second Gas Injection System for HL-LHC. Vacuum compatibility study for new HL-LHC VAX Plan activity was created (by *TE-VSC as coordinator*) but not exhaustive: PLAN 10319
2. **EYETS2016 and YETS2017** routine activities connected with detectors opening: Nothing in PLAN

LHC Beam pipes activities

- **EYETS 2016-2017 – Activities not in PLAN :**
 - **LSS2 & LSS8: Request to improve MKID performances:** upgrade of vacuum layout: Venting, mechanical and NEG activation (Just 1 of this activities 'under approval' in PLAN but no details about new layout, cables, chambers production, validation of components, etc.).
 - **TDE consolidation activities:** No PLAN Activity.
 - **BGI exchange** with spare chambers: Venting, mechanical and NEG activation: No PLAN Activity. (Activity still to be validated)
 - **New ALFA station in LSS1:** New layout, venting, mechanical and NEG activation: No PLAN Activity
 - **Exchange of Roman pot detectors:** Venting, mechanical and NEG activation: No PLAN Activity
 - **New ionization gauge for SMOG LHCb:** New layout, venting, mechanical and NEG activation: No PLAN Activity
 - **Exchange of A31L2 dipole:** Both beam vacuum and insulation: No PLAN Activity (Activity still to be validated)

HL-LHC Activities for the LS2

- PLAN 10015: **TDIS** - Activity announced but layout still to be defined. Difficult to estimate properly the resources.
- PLAN 11091: **Prototype WS: Not in the baseline anymore.** Plan activity should be deleted
- PLAN 10905: **8 x TCP by TCPP** - No VSC resources requested
- PLAN 10833: **mini-TAXN and TCDXM mask in LSS8**: No VSC resources requested
- PLAN 11085: **New bypass TCLD in LSS7 - 'Created'** state
- PLAN 110643: **New bypass TCLD in LSS2**: Double PLAN activities exist
- PLAN 10196: **Hollow electron lens** - No VSC resources requested
- **Not in PLAN (Not knowing their status):**
 - **4 High bandwidth BPMs (for crab cavities and instability diagnosis).**
 - **MKIs Updates-prototype in LSS2 and ISS8**

Known activities impacting TE-VSC not or not well defined in PLAN: *Projects*



Projects Involvement

➤ ELENA Transfer Line Installation :

- Heavy involvements for 7-8 months pre- and during beginning of **LS2**. Nothing in PLAN

➤ HIE-ISOLDE:

- Not all activities declared in PLAN. Heavy involvement also during the **EYETS 2016-2017**

➤ AWAKE:

- Activities duplicated: PLAN 10133 vs 11078 – PLAN 11098 – 11079 – PLAN 11096 – 11079
- Heavy involvement also during the **EYETS 2016-2017**

➤ AD:

- **EYETS 2016-2017**: Nothing in PLAN
 - Replacement of the BHN 33 bake out sector 4
 - DE experimental lines work:
 - Replacement of DE1.VPI45 (Asacusa)
 - DE2.VVS42 exchange (Alpha)

Project Involvement

➤ NA62:

- New sectorization foreseen during the **EYETS2016-2017** not declared in PLAN.

➤ LINAC4:

- PLAN 10933 for **LS2**: Installation of 24 new magnets for consolidation line LINAC to PS Booster: No VSC resources requested.

➤ LEIR:

- BPM activities for both **EYETS2016-2017 and YETS2017-2018**: new layout, production of chambers, bellow modules, supports, bake out installation and NEG coating activation: 'Created State'
- Endoscopy of MCP and bake out of sector 5: No PLAN.

➤ MEDICIS:

- Request of installation during the EYETS: No PLAN

TE-VSC 2016 Operation Activities for *PS and SPS Complex* not in PLAN



SPS activities not in PLAN

2016 Operation interventions & EYETS 2016-2017

- 2XZS exchange (third one was not foreseen but during YETS);
- Magnet exchange in 160;
- TT20 Fast Valve;
- 520 air leak (T piece);
- 520 fast wire scanner accident + its reinstallation;
- 251 leak (still to be understood);
- TIDVG#3 leak (TIDVG#2 preparation at surface): **heavy involvement with EN-STI**;
- TT10 air leak, corrosion related;
- 15-20 Magnets exchange not declared for the EYETS2016-217;

cPS activities during 2016 operation not in PLAN

AD

- Reparation of cryo-compressor failure

HIE-ISOLDE

- Replacement of Si detector in XT00
- Leak detection CM2
- XT02: Intervention in Dbox 400 and 900
- XT00: Intervention in Dbox 1300

LINAC2

- Replacement of source's cathode
- Replacement of scroll pump in tank 3
- Replacement of scroll pump in source
- RGA of source
- Leak detection source

- Replacement of failing fan of TMP in source
- Leak on feeder loop of secondary vacuum of tank 2
- Leak detection and RGA on source
- Alignment of solenoids
- Air leak on tank 1 due to a broken pickup

LINAC3

- Removal of pepper pot
- Replacement of carbon foils
- Replacement of scroll in ITL
- Replacement of scroll in source

cPS activities during 2016 operation not in PLAN

LINAC4

- Issue on PIMS10 (endoscopy)
- Leak pickup PIMS12
- Leak pickup DTL1 and 2
- Leak pickup DTL2 and 3
- Replacement of scroll in source
- Leak pickup DTL3
- Replacement of scroll in source
- Replacement of pickup and VVR in DTL vacuum sector

PS

- Installation of BCT41

- Repair leak on dump SS48

- Removal of BCT LBS.BCT63

- Replacement of transformers in LTB line

- Leak on RF cavity SS46

PSB

- Installation of mu-metal on 4L1

- Removal of mu-metal on 4L1

- Leak detection BHZ151

- BHZ62 replacement of vacuum chamber due to a leak

Extraction from PLAN

Overview of activities TE-VSC as Coordinator



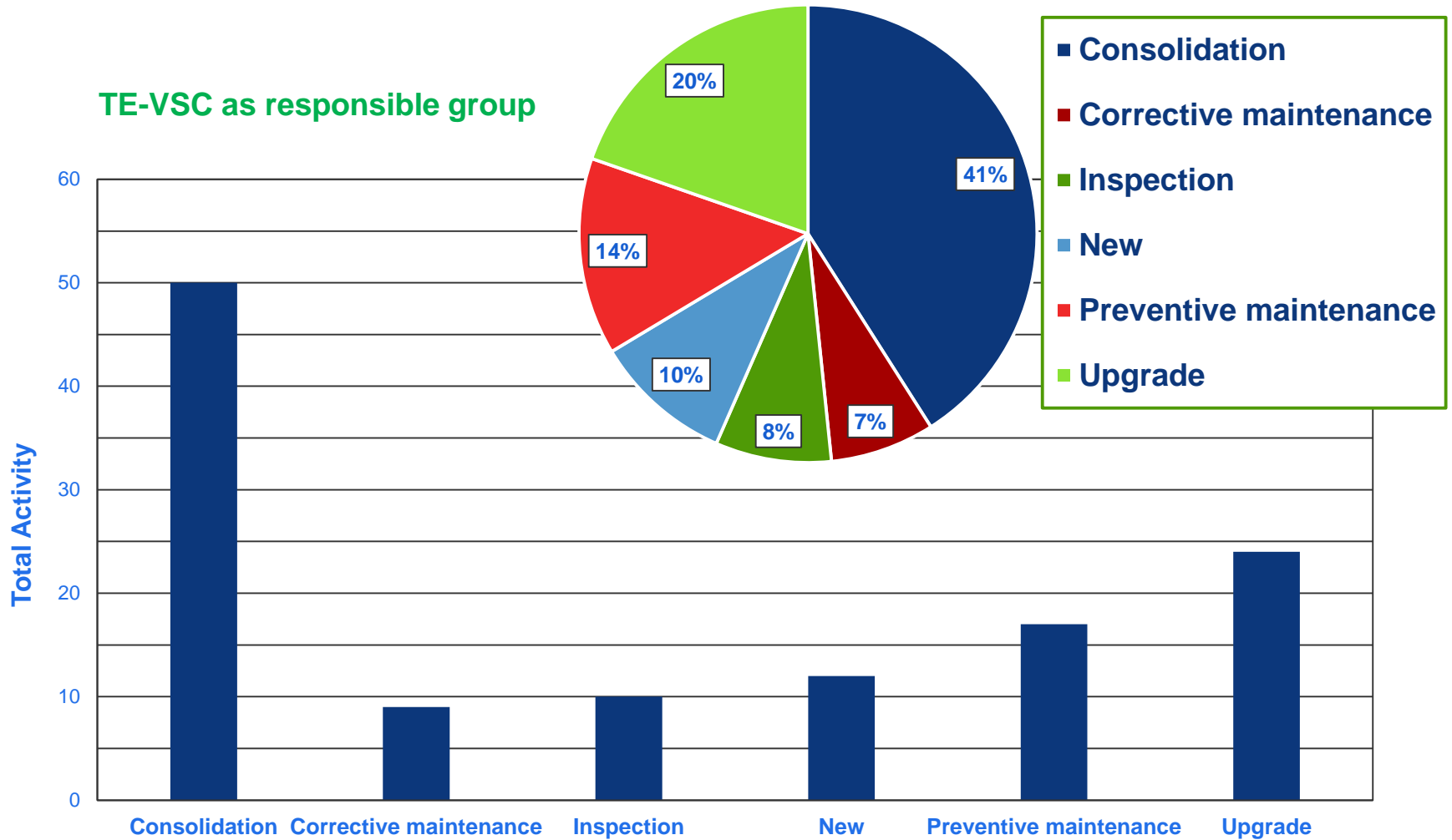
LS2 DAYS

7-8 NOVEMBER 2016 15



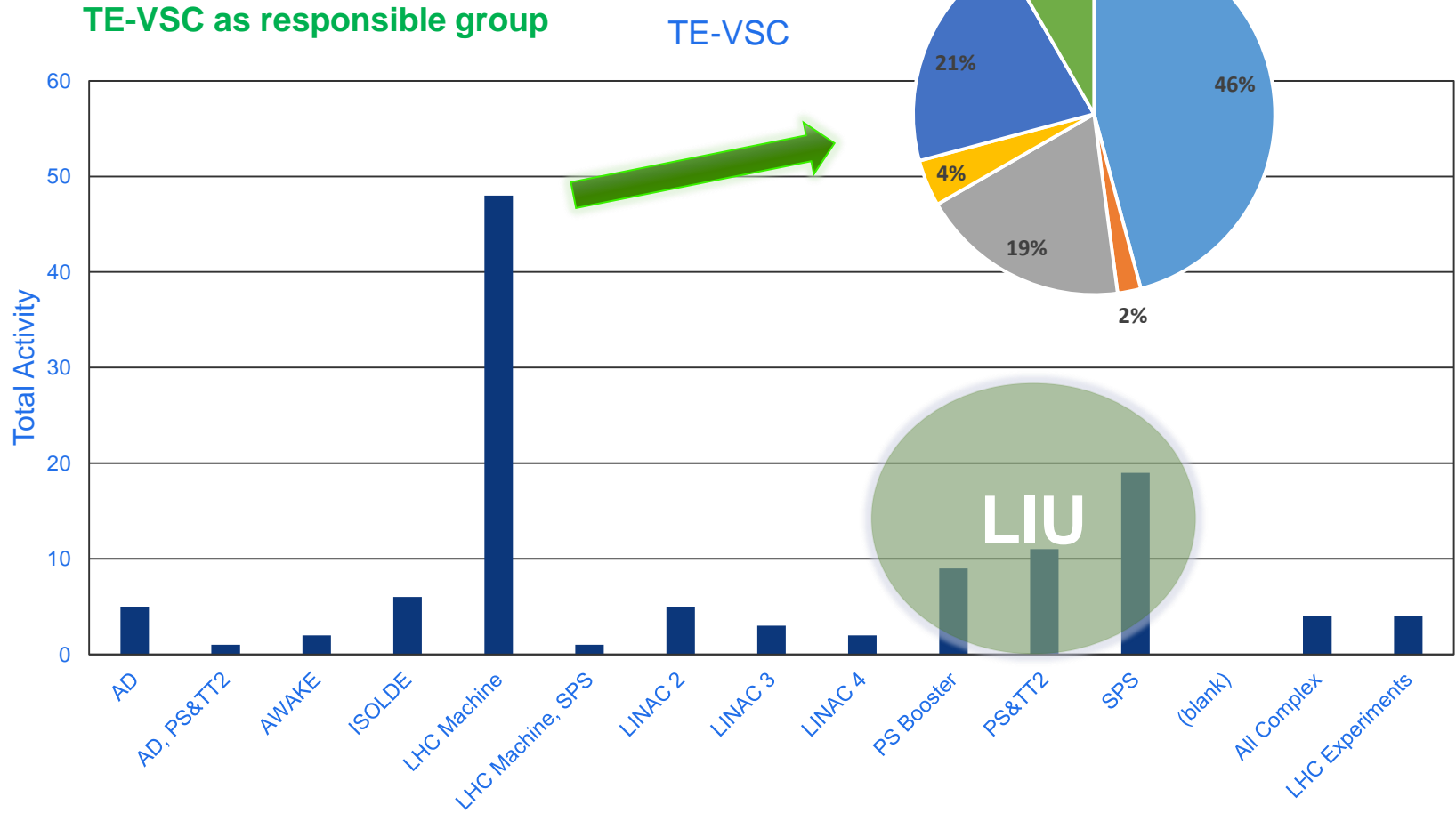
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Total Activities per activity type



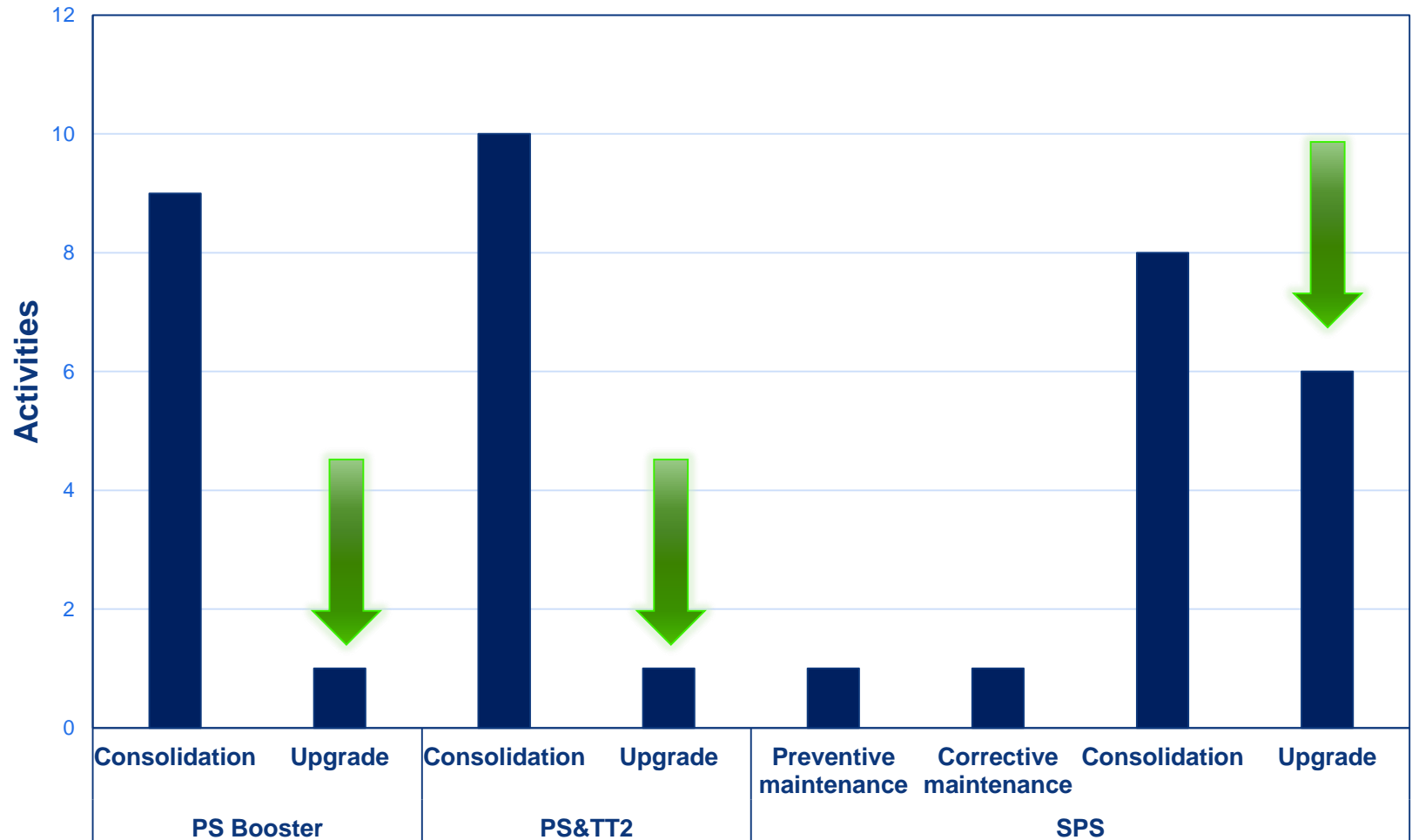
Main Activities per facility:

- LHC Machine Consolidation
- LHC Machine Corrective maintenance
- LHC Machine Inspection
- LHC Machine New
- LHC Machine Preventive maintenance



Main Activities of PS and SPS Complex

TE-VSC as coordinator



TE-VSC as coordinator: Upgrade activities

SPS Complex:

- **New vacuum layout in LSS3 after cavity upgrade: LIU for SPS**
- Finish arc re-sectorization. 12 valves to be installed: **TE-VSC**
- **New vacuum layout in LSS1 and LSS5 after installation of new dump in LSS5: LIU for SPS**
- EYETS: **aC coating** of QF+SSS and **impedance reduction** pilot run (up to 1 sextant) and MBB aC coating on limited half cells (4). Replacement of 10% DN159 vacuum chambers with coated vacuum chambers: **LIU for SPS**
- LS2: **aC coating** of QF+SSS and **impedance reduction** (5 sextant) and MBB aC coating on limited half cells (1 arc). Coating of 90% DN159 vacuum chambers.
LIU for SPS

PS Booster:

- **Modification of the injection and extraction. Dismantle and rebuild of BI, BT and BTM lines and BR10 vacuum sector: LIU for the Booster**

PS & TT2 :

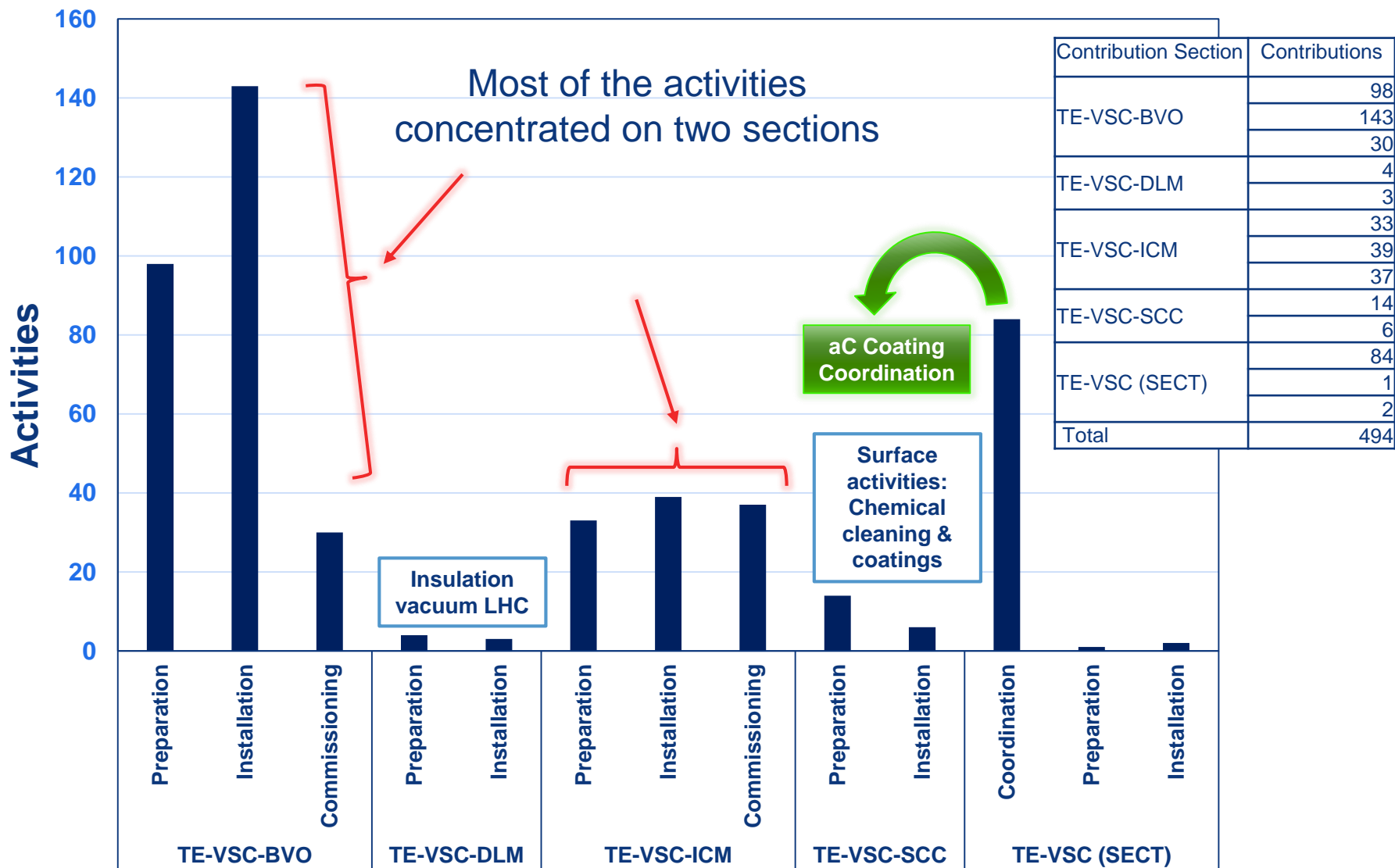
- **New vacuum chambers for MU41 and MU42 to increase aperture from the Booster LIU upgrade: LIU for the PS**

Extraction from PLAN

TE-VSC as Contributor Group & Resource Analysis



Main activity per TE-VSC sections

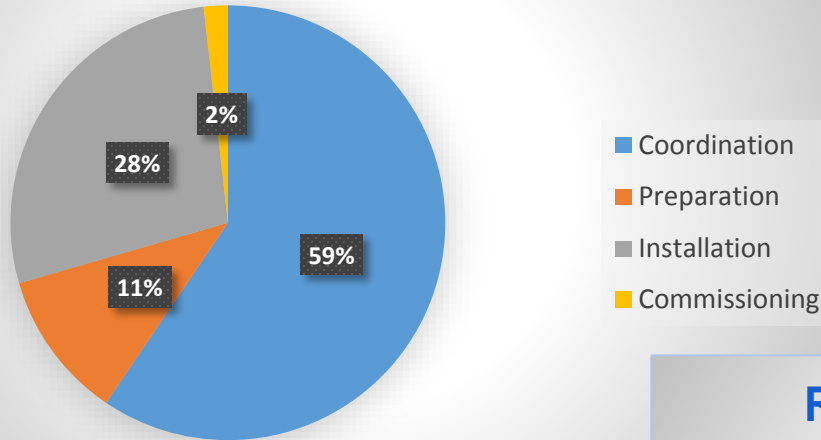


Resources declared in PLAN: wk of FTE

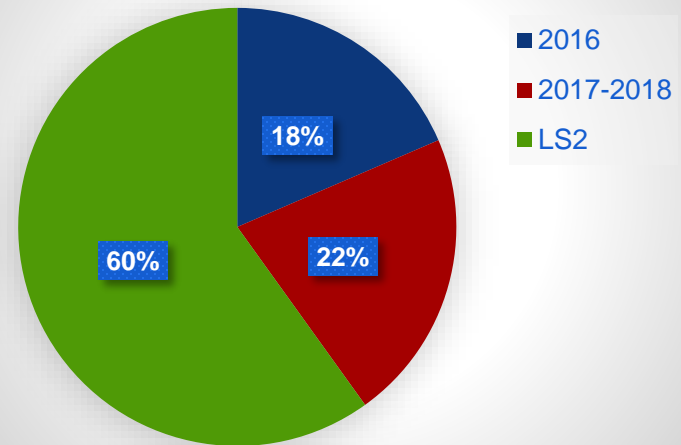
Activity Phase	Activity Status	EYETS 2016-2017		YETS 2017-2018		LS2				Général Total FTE weeks
		2015	2016	2017	2018	2019	2020	LS2	Not Assigned	
aC & NEG Coating & chemical cleaning activities										
	Under Approval									
	Created	-	0	0	0	-	-	-	55	55
Preparation	Under Approval	30	270	157	193	13	1	22	-	688
	Prioritization	-	0	-	-	-	-	-	-	0
	Resource Allocation	0	22	11	13	-	-	3	-	49
	Created	-	0	0	0	-	-	0	75	75
Ins	Under Approval									
	Created									
	Under Approval									
	Created									
	Resource Allocation	-	9	0	0	22	0	22	-	54
Commissioning	Created	-	-	-	-	-	-	-	0	0
	Under Approval	-	31	17	4	1	5	55	-	113
	Resource Allocation	-	-	9	-	-	2	4	-	15
Total		45	1283	684	862	78	14	2559	1645	7,173

Resources declared in PLAN: wk of FTE

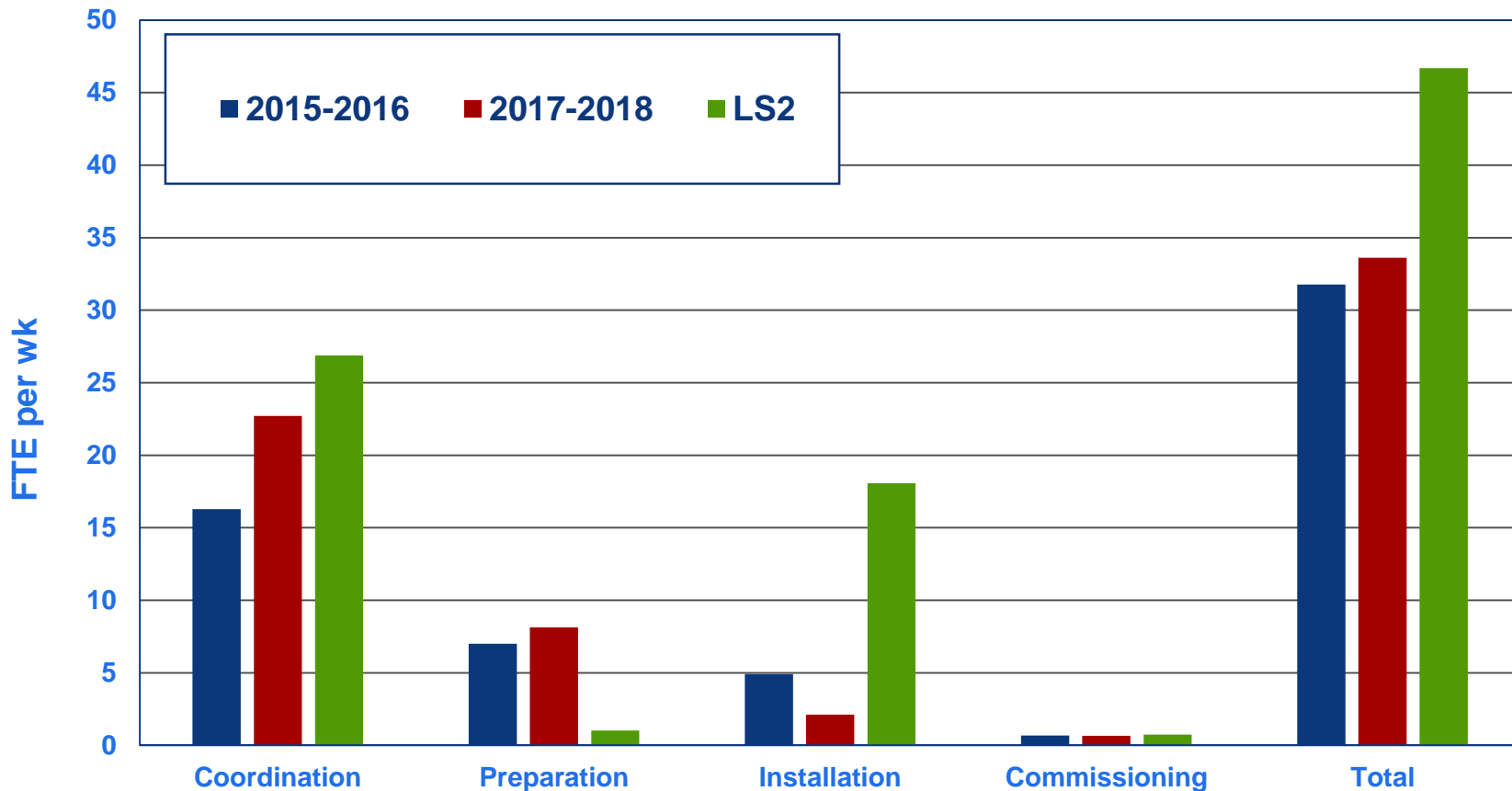
Total Resources Use



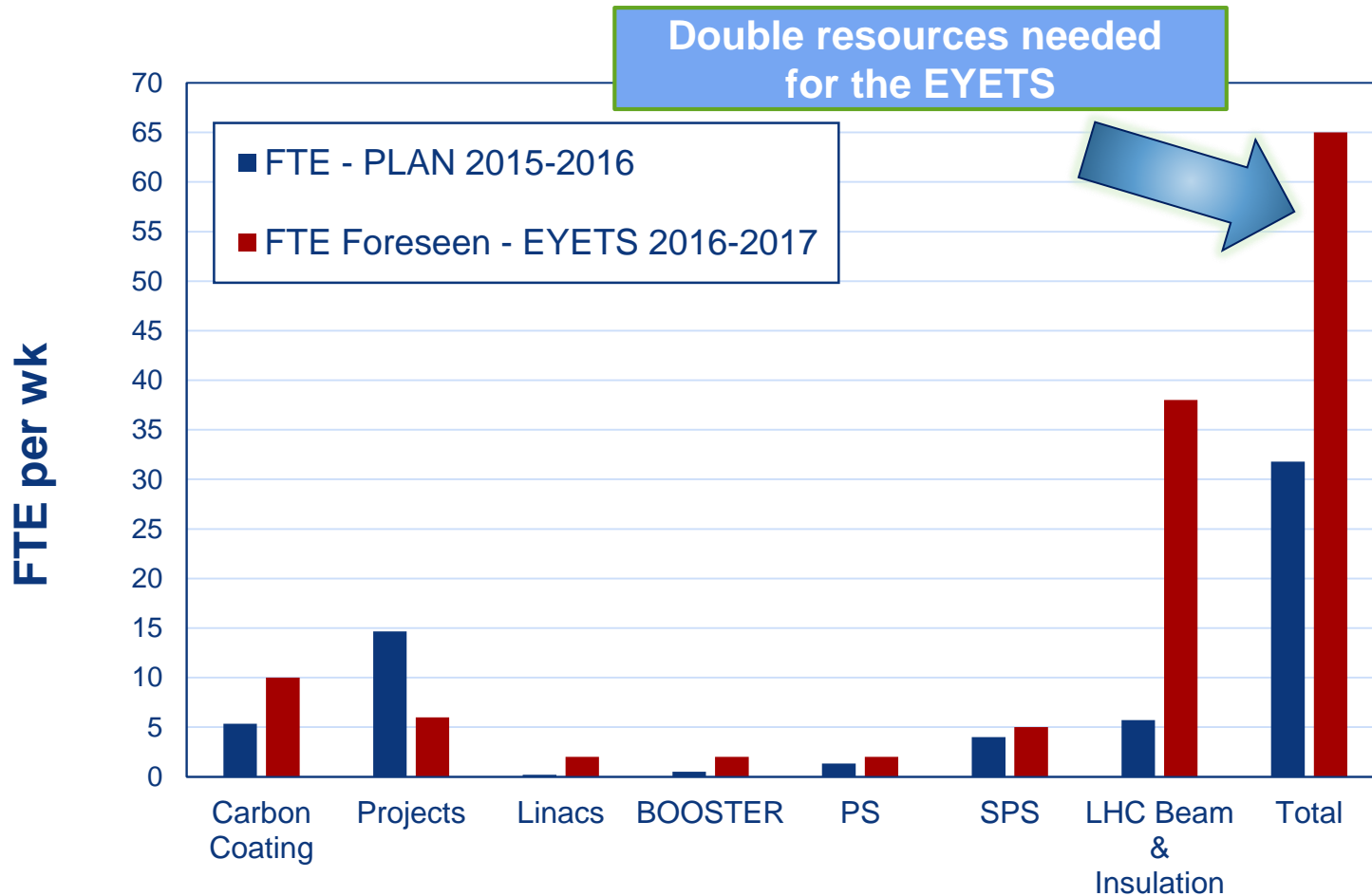
Resources per period



Resources declared in PLAN: FTE per wk



Comparison of resources for period 2015-2016 VS. Real resources during just the EYETS 2016-2017



Summary: Main Activities

LHC

- Heavy involvement for the experiments upgrade: ALICE, CMS, ATLAS and LHCb
- Involvement for HL-LHC is increasing

SPS, PS, Booster & Linac4:

- The LS2 is the LIU long shutdown: Important resources needed for all the stages: preparation, testing, installation and commissioning

Projects:

- Very important to analyse in details the resources and add their activities to the main planning: ELENA, HIE-ISOLDE, AWAKE, MEDICIS and OPENMED

To complete the EYETS 2016-2017 are necessary about the double of the resources declared in PLAN for the period 2015 and 2016 :

- ‘Operation’ interventions need to be taken in consideration and can not be foreseen in advance: Need to keep some margin in the resources
- All the projects/experiments/groups must declare their activities as precise as possible if we want to have a resource that correspond as closed as possible to the reality

Radiological considerations

Example: after 4 months of cool down (RP survey 18/04/2013) Dose rates at 40 cm

➤ PSB:

- Average: 34 $\mu\text{Sv/h}$ (88h to reach 3mSv)
- Median: 11 $\mu\text{Sv/h}$ (34x8h/days to reach 3mSv)

➤ PS:

- Average: 89 $\mu\text{Sv/h}$ (34h to reach 3mSv)
- Median: 23 $\mu\text{Sv/h}$ (16x8h/days to reach 3mSv)

TE-VSC technicians need to spend long periods in the machine
Resources for the LIU projects need to be analyzed considering also the
radiological aspects

Thank you for your attention



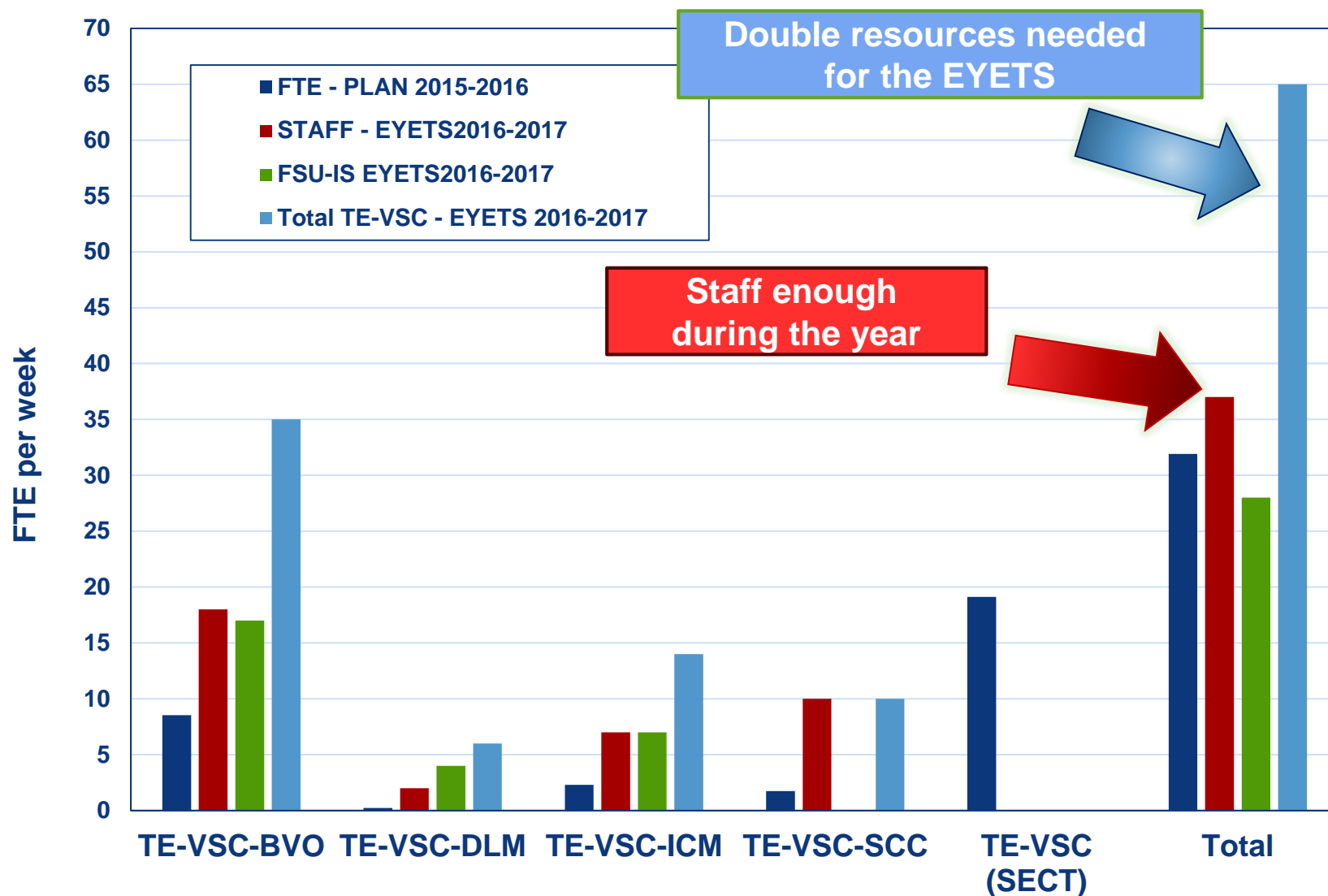
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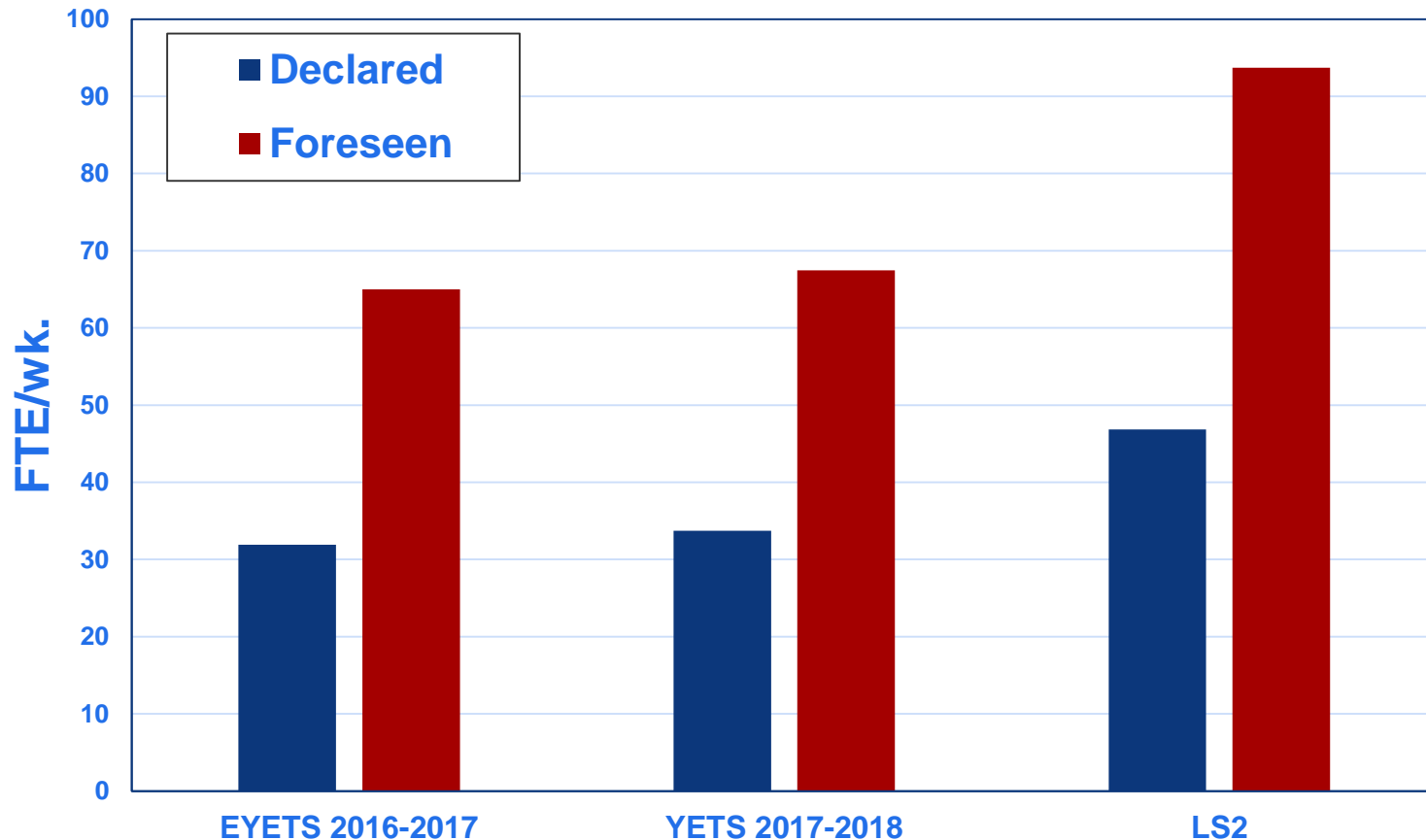


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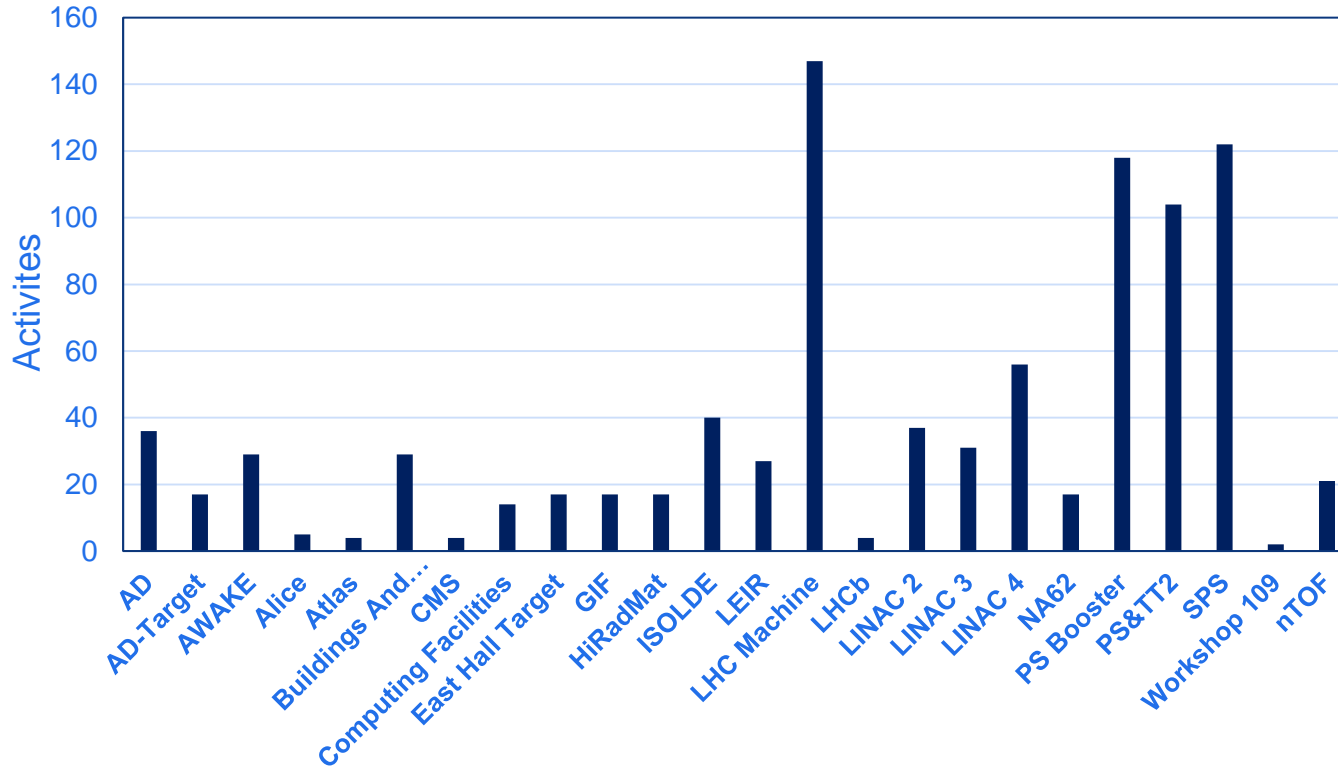
Comparison of resources for period 2015-2016 & real resources during just the EYETS 2016-2017



Foreseen resources for coming periods



Main activity per facility



Facility	Contributions
AD	36
AD-Target	17
AWAKE	29
Alice	5
Atlas	4
Buildings And Other Facilities	29
CMS	4
Computing Facilities	14
East Hall Target	17
GIF	17
HiRadMat	17
ISOLDE	40
LEIR	27
LHC Machine	147
LHCb	4
LINAC 2	37
LINAC 3	31
LINAC 4	56
NA62	17
PS Booster	118
PS&TT2	104
SPS	122
Workshop 109	2
nTOF	21
Total	915