



## HL-LHC Make or Buy Plan

EDMS: [1868587](https://cds.cern.ch/record/1868587)

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# HL-LHC Make or Buy Plan

- Make or Buy Plan is part of the [QAMP](#) of the project. Procurement is a good indicator of the progress of the project. Impact on master schedule
- Update carried out with all WPLs and the WPEs in charge of the different equipment/components (technical contacts). Updated version every 6 months plus maintenance of the List of DRs file in the meantime
- Update of the status of the on-going tendering and identification of the tendering which will come in the next 18 months (at least). Master list of DRs of the project (past, present, future). [Link List of DRs](#)
- Goal: More accurate information for the plans (info shared with HL Management, Department/Groups Heads, Procurement, ILOs)

# HL-LHC Make or Buy Plan

The Make or Buy Plan is being updated every six months (dynamic information) with the WPLs and WPEs. The main outcomes of this process are:

- Strategy of the Work Package for acquisition (through the life-cycle)
- List of Departmental Request (DRs) that are foreseen for the next 18 months. Assessment of the orders
- Brochure: Needs and firms of each WP
- Detailed tendering schedule (to match the Master Planning of the project)
- Budget estimation vs Order Cost. Budget Profile
- Statistics

# HL-LHC Make or Buy Strategy

- Strategy of the Work Package in terms of acquisition. Assessment of how the WP will acquire the equipment/services which belong to the PBS. Each phase is assessed (design, fabrication, installation/commissioning)

- In house?
- Collaboration?
- Industry (supply/service contract)
- Combination of any of above...?

HiLumi HL-LHC PROJECT									
EDMS NO. 1692384 REV. 0.1 VALIDITY DRAFT									
ACQUISITION					PUBLIC				
MAKE OR BUY PLAN									
PBS Iter	Name	Number of units	Foreseen Cost	Engineering specification	Fabrication	Assembly	Verification	Installation	Commissioning
14.1.1.0.0.0	Beam transfer & kickers - Injection S								
14.1.2.0.0.0	Beam transfer & kickers - Injection S								
14.1.3.0.0.0	Beam transfer & kickers - Injection S								
14.1.4.0.0.0	Beam transfer & kickers - Injection S								
14.1.5.0.0.0	Beam transfer & kickers - Injection S								
14.2.1.0.0.0	Beam transfer & kickers - LHC Beam								
14.2.2.0.0.0	Beam transfer & kickers - LHC Beam								
14.2.3.0.0.0	Beam transfer & kickers - LHC Beam								

HiLumi HL-LHC PROJECT									
EDMS NO. 1692437 REV. 0.1 VALIDITY DRAFT									
ACQUISITION					PUBLIC				
MAKE OR BUY PLAN									
PBS Iter	Name	Number of units	Foreseen Cost	Engineering specification	Fabrication	Assembly	Verification	Installation	Commissioning
8.110.0.0	TAXIN ATLAS								
8.120.0.0	TAXIN CMS								
8.130.0.0	TAXIN LHCB								
8.210.0.0	TAXIS ATLAS								
8.220.0.0	TAXIS CMS								
8.300.0.0	8 - Collider-Experiments Interf								

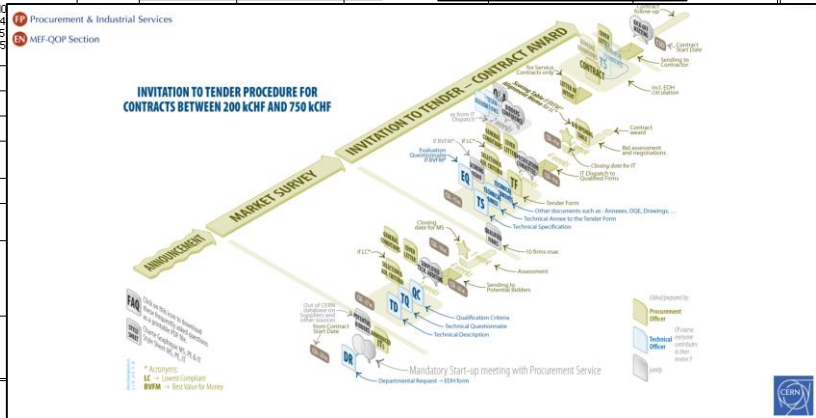
HiLumi HL-LHC PROJECT									
EDMS NO. 1691383 REV. 1.1 VALIDITY DRAFT									
ACQUISITION					PUBLIC				
MAKE OR BUY PLAN									
PBS Iter	Name	Number of units	Foreseen Cost	Engineering specification	Fabrication	Assembly	Verification	Installation	Commissioning
7.1.0.0.0.0	7 - Machine protection - Energy extraction system		>750k	CERN + New Collaboration	New procurement contract	New procurement contract	CERN + New Contract	CERN + New Collaboration	CERN + New Collaboration
7.2.0.0.0.0	7 - Machine protection - Beam interlock system		>750k	CERN	New procurement contract	New procurement contract	CERN + New Contract	CERN + New Collaboration	CERN
7.4.0.0.0.0	7 - Machine protection - Quench detection system		>750k	CERN	New procurement contract	New procurement contract	CERN + New Contract	CERN + New Collaboration	CERN
7.6.0.0.0.0	7 - Machine protection - Powering interlock system		>750k	CERN	New procurement contract	New procurement contract	CERN + New Contract	CERN + New Collaboration	CERN

# HL-LHC Make or Buy Plan – List of DRs

- List of Departmental Requests (v1.4) with all the orders for the next 18 months (at least) that will require a DR (c>50 kCHF)
- What is coming? When tendering will be launched? When it is required on site? How much does it cost? Deviations from previous versions?

This information is shared and assessed with ILOs, CERN Procurement Department and Specification Committee team

LIST OF FORESEEN DEPARTMENTAL REQUESTS (DRs) 2016-2018										
Package Name	Work Package Reference	Detailed Description	Foreseen Cost Range	Current Tender Status	Tender Reference	Starting Date for Tendering (PE, MS, or IT)	Manufacturing time	Required On Site	Quantity	EDMS Docum
Halo Cleaning - Absorber blocks for TCSPM	WP05	Supply of a minimum of 120 absorber blocks for the HL-LHC collimator jaws. This will involve the production of a novel material based on Molybdenum Carbide - Graphite composite (MoG), its post-production heat treatments and the machining to the specified	> 750k	In progress	MS-4201/ENH/HL IT-4201/ENH/HL	Mar-16	3 months	Dec-17	120 pcs	1533587
IR Cleaning - Absorber blocks for TCTPM	WP05	Supply of a minimum of 120 absorber blocks for the HL-LHC collimator jaws. This will involve the production of a novel material based on Molybdenum Carbide - Graphite composite (MoG), its post-production heat treatments and the machining to the specified	200k << 750k	In progress	MS-4277/ENH/HL	Oct-16	12 months	Mar-18	100 pcs	1724530
Halo Cleaning - Crystal Collimation (TCPC)	WP05	Components crystal collimation ions at IR7	50k << 200k	Not started		Aug-17	6 months	Jun-18		
TCSPM (Target Collimator Tertiary Pick-up Metallic), TCTPM (Target Primary Collimator Pick-up Metallic), TCPPM (Target Primary Collimator Pick-up Metallic), DS Collimation - TCLDA (Target Collimator Laser Diode Assembly)	WP05	Manufacture and supply of 24 collimators to be installed during LS2	> 750k	In progress	MS-4272	Nov-16	12 months	Jun-19		
GLDcop	WP05	Material to be used in the Jaws of the collimators to be manufactured for LS2	200k << 750k	Not started	Single tender	Apr-17		Dec-17		
Stainless Steel 304L and 316LN	WP05	Raw material for the manufacturing of the Vacuum tank	200k << 750k	Not started		Apr-17		Dec-17		
Connectors	WP05	Connectors with multiple and single connection	50k << 200k	Not started		Jun-17		Dec-17		
Roller Screws	WP05	Mechanical actuator that requires high precision and rigidity and will be used as a component of the collimators to be installed for LS2	200k << 750k	Not started		Jul-17		Mar-18		
Hypertac connectors	WP05	Hypertac connectors - Pair M/F (single tender)	50k << 200k	In progress	Single tender	Jun-17		Dec-17		
Measurement & controls - DCCT (Direct Current Current Transformer)	WP06B	Device for high precision current measurement	50k << 200k	Not started		May-17	3 months	May-18		
Raw materials - Tungsten absorbers for series production	WP12	Supply of around 8000 kg of precision machined tungsten absorbers with unit lengths of 400 mm for HL-LHC beam screens in IR 1B5. Tungsten heavy alloy with > 95% W, Cu and Ni (Ni < +3.5%, Fe < 30 ppm). Magnetic permeability < 1.005 between 4.2 and 293 K.	> 750k	In progress	DR-6558419 MS-4077 (from magnets group)	Mar-17	5 years	Jun-18		
Beam Screen Facility plus Finishing	WP12	Beam Screen Facility plus Finishing (laser engineered welding machine). Industrial laser machine to be installed in the beam screen facility in SNA1B. The laser will be used for the assembly of HL-LHC beam screens from components purchased in industry.	200k << 750k	In progress	DR-6638203	Jan-17	8 months	Aug-17		



# HL-LHC Make or Buy Plan – List of DRs

- The information provided in the List of DRs allows us to keep track of the different tendering processes (monitoring to avoid delays)
- It is so important to launch the process with enough time (fast track can not be considered as regular practice). As a general rule:
  - For **MS/IT (200k < c < 750k) – 6 months** before the contract is required
  - For **FC (c > 750k) – 10 months** in advance of the foreseen **FC**
  - Single Tender contracts **above 200k** to be approved by FC. To be taken into account for these cases
- Assessment of the foreseen orders:
  - Is it linked to another tender? If so, are the schedules compatible each other?
  - Do we have to purchase raw material/tooling? If so, when is it to be launched?
  - Is the timing (MS/IT) correct ?

# HL-LHC Make or Buy Plan – Brochure

- Brochure of the WP with the supplies/services required by each one and the current known firms that can provide them

### WP3 – Insertion Region Magnets

**DOMAINS OF ACTIVITY OF THE WORK PACKAGE**

Magnets components and assemblies	
Cryostats and subcomponents for cryogenic equipment	
Raw Materials	

**Looking for...**

- Metal works for cryostat manufacturing
- Suppliers of full cryostat or components as per CERN specifications and requirements (built to print manufacturing)

### WP4 – Crab Cavities & RF

**DOMAINS OF ACTIVITY OF THE WORK PACKAGE**

Electrical equipment, electronics and instrumentation for accelerators	
Cryostats and subcomponents for cryogenic equipment	
High precision Assembling and manufacturing technologies	
Raw Materials	

**Looking for...**

- R&D on e-beam welding, control weld shrinkage, deformation studies, weld metallurgy and integrity
- E-beam welding of Nb-to-NbTi and/or Nb-to-Ti

### WP12 – Vacuum & Beam Screen

**DOMAINS OF ACTIVITY OF THE WORK PACKAGE**

Ultra high vacuum components and systems	
High precision Assembling and manufacturing technologies	
Raw Materials	

**Looking for...**

- High precision machining for Beam Screens
- UHV requirements (cleanliness, leak tightness, etc.)

Domains of Activity	Presently identified as potential suppliers			
	MS	Firms	MS	Firms
Manufacturers of Superconducting Magnets	AT		IT	ASG Superconductors

Domains of Activity	Presently identified as potential suppliers			
	MS	Firms	MS	Firms
Magnets Cryostat	AT		IT	SIMIC, Criotec, Zanon, Alca Tech, Fambini, CSC
	BE	Amos, Ortmans	NL	Cryoworld, Cryovet
	BG		NO	
	CZ		PK	
	CH		PL	SFUP
	CY		PT	Arsopi
	DE	Raff+Grund, Butting, NTG, Pink	RO	
	DK		RS	
	ES	Cadinox, Vacuum Projects, Asturfelto, Nortemecanica	SE	Ornialp Unozon, Ekstroem
	FI		SI	
	FR	Allia	SK	
	GR		TR	
	HU		UA	
	IL		UK	Metalcraft
	IN			

**Looking for...**

- Metal works for cryostat manufacturing
- Suppliers of full cryostat or components as per CERN specifications and requirements (built to print manufacturing)

Domains of Activity	Presently identified as potential suppliers			
	MS	Firms	MS	Firms
RF Controls: Digital I/Q Demodulators & DSPs	AT	AMS	IT	

Domains of Activity	Presently identified as potential suppliers			
	MS	Firms	MS	Firms
Electron Beam Welding of Nb and NbTi	AT		IT	E. Zanon
	BE		NL	
	BG		NO	
	CZ		PK	
	CH		PL	
	CY		PT	
	DE	Research Instruments	RO	
	DK		RS	
	ES		SE	
	FI		SI	
	FR	BMAX, SDMS	SK	
	GR		TR	
	HU		UA	
	IL		UK	
	IN			

**Looking for...**

- R&D on e-beam welding, control weld shrinkage, deformation studies, weld metallurgy and integrity
- E-beam welding of Nb-to-NbTi and/or Nb-to-Ti

Domains of Activity	Presently identified as potential suppliers			
	MS	Firms	MS	Firms
Laser Engineered Surface	AT		IT	

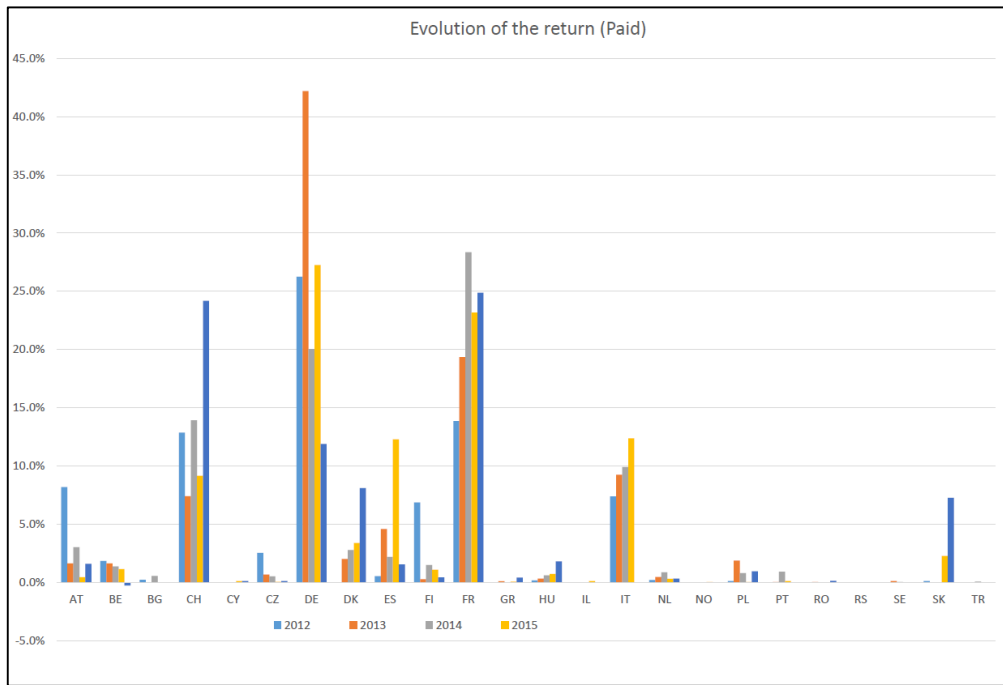
Domains of Activity	Presently identified as potential suppliers			
	MS	Firms	MS	Firms
Beam screen punching/forming/welding	AT		IT	
	BE		NL	
	BG		NO	
	CZ		PK	
	CH		PL	
	CY		PT	
	DE	Butting	RO	
	DK		RS	
	ES		SE	
	FI		SI	
	FR		SK	
	GR		TR	
	HU		UA	
	IL		UK	
	IN			

**Looking for...**

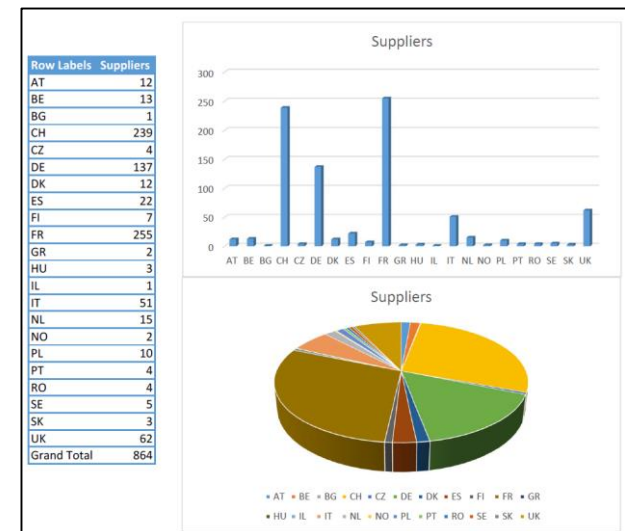
- High precision machining for Beam Screens
- UHV requirements (cleanliness, leak tightness, etc.)

# HL-LHC Make or Buy Plan – Statistics

- Estimation (DR) vs Adjudication price (Order) – Internal information
- Orders/country
  - Return/country, evolution/country, etc.
  - Identified potential suppliers/country (by WP, by Domain, etc.)
  - Special efforts led to certain countries to improve their situation



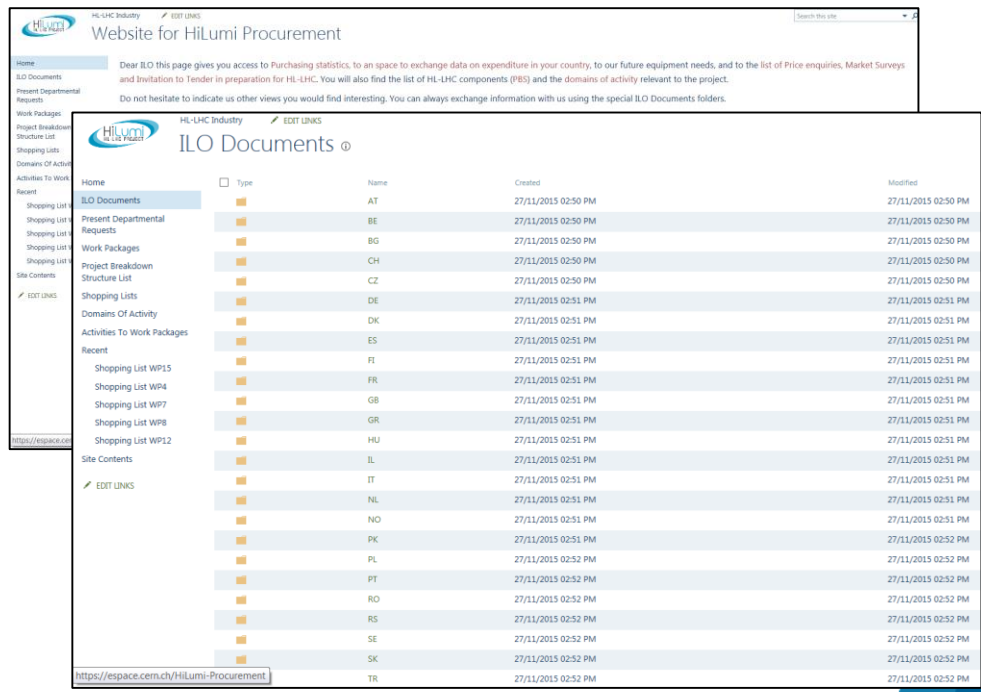
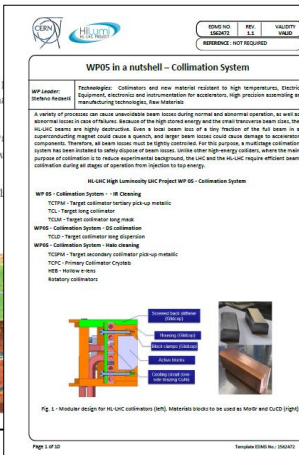
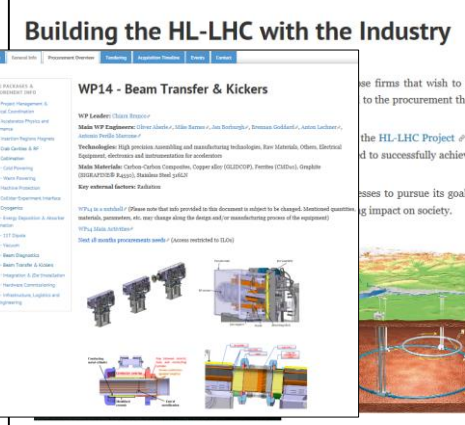
Firms	Supplier Code	Country of Origin	1	2	3	4	5	6	7	8	9	10	WP3	WP4	WP5	WP6A	WP6B	WP7	WP8	WP9	WP11	WP12	WP13	WP14	WP17	Found on	
ANTEC.S.A.	ANTE01	ES	X										X												X	ID	
ASTURFETO	ASTU01	ES						X	X				X	X												X	Broch
Breca	BRES01	ES		X																						X	Broch
Cadinov S.A.	CADI04	ES	X					X					X	X						X	X	X				ID/Broch	
CDTI - Spanish ILO	CDTI50	ES																									ID
CTS - CENTRO DE TRATAMIENTOS DE LA SUPERFICIE	CTS-50	ES							X																		Broch
EP	ELG01	ES							X											X							Broch
ELYTT ENERGY	ELYT01	ES		X									X									X					ID
Empresarios Agrupados	AGRU50	ES		X									X									X					ID
India	INDI50	ES		X									X														Broch
JEMA	JEMA35	ES		X													X										ID/Broch
LASER GALICIA	LASE36	ES							X								X										Broch
MER Comunicaciones	MER50	ES		X									X														Broch
NANOPIE RESEARCH	NANO12	ES						X																			Broch
Nortemedica.S.A.	NORT03	ES						X	X				X	X					X			X					ID/Broch
TTI Norte	TTN-01	ES		X									X	X											X	X	Broch
Vacuum-Projects (The)	TVP-03	ES	X	X									X	X								X	X				Broch



# Shared Information

HL Make or Buy Outputs are shared through the HL-LHC communication channels (for procurement matters):

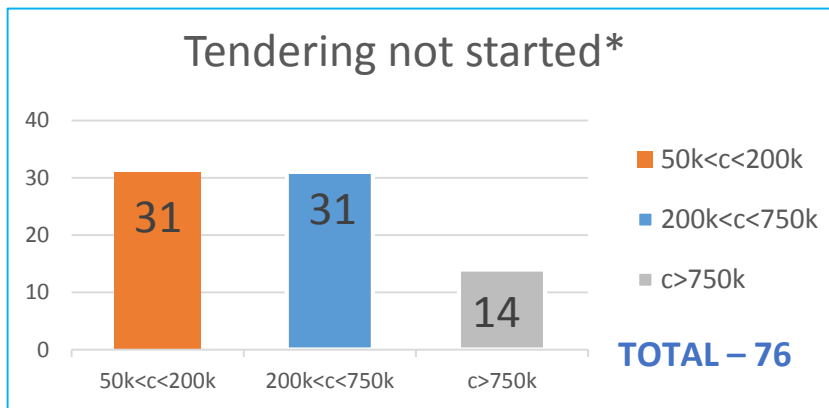
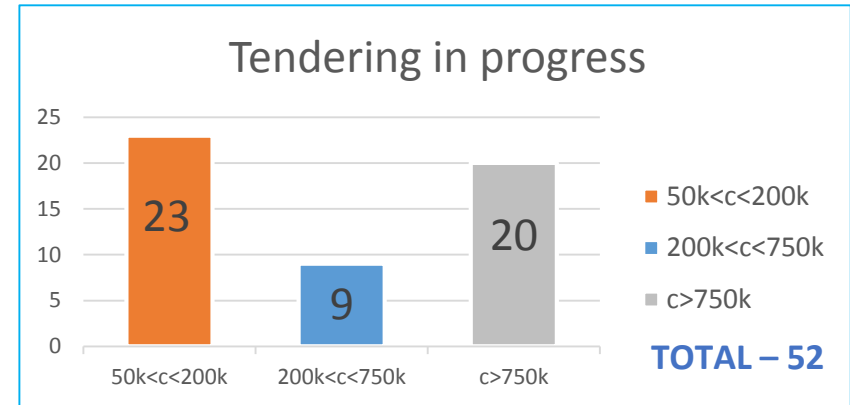
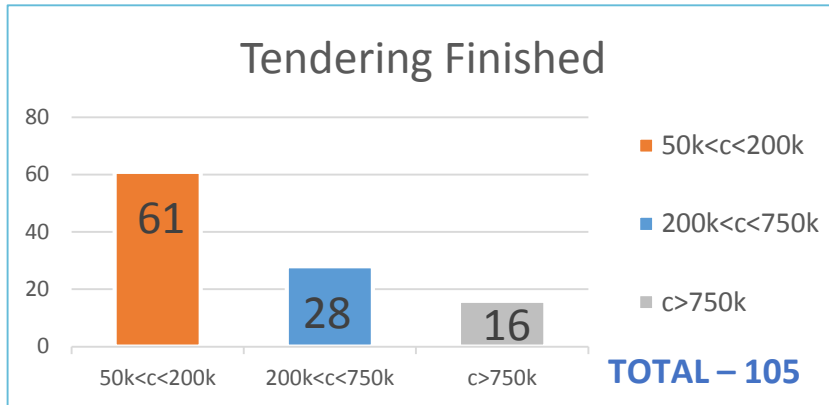
- [HL-LHC procurement](#) - Public Website with the main information and needs of HL Work Packages in terms of procurement (domains of activity, main contacts, acquisition timeline, industrial events, etc.)
- [ILOs Portal](#) (restricted access to ILOs) – Main outcomes of the Make or Buy Plan and Statistics of each country are on regular basis







# Summary of the Current Status



\*Basically for the **next 18 months** but in some cases (WP6A, WP7, WP13, WP15) also onwards



Good progress and hectic activity for procurement. It is required to keep high attention on this activity to avoid delays

# Summary

- Procurement guidelines to be compulsory followed for any supply/service (Departmental Request mandatory when cost > 50 kCHF)
- Make or Buy process pursues to get as much rigorous information as possible for each WP in terms of procurement. Procurement is a good indicator of the project progress
- Strategic plan of each WP in terms of procurement. Assessment if the strategy is in line with the project needs (cost/schedule/risk)
- Foreseen DRs that will be launched for the next 18 months (at least). Follow-up of the tendering or the project
- Identification of those areas with no large number of known suppliers (few alternatives). Mobilize the ILOs to seek within their countries
- Check the situation/progress of each country (return). Assessment for launching campaigns to improve it
- Foreseen the schedule of supplies (acquisition timeline)



***Thanks  
Questions?***

