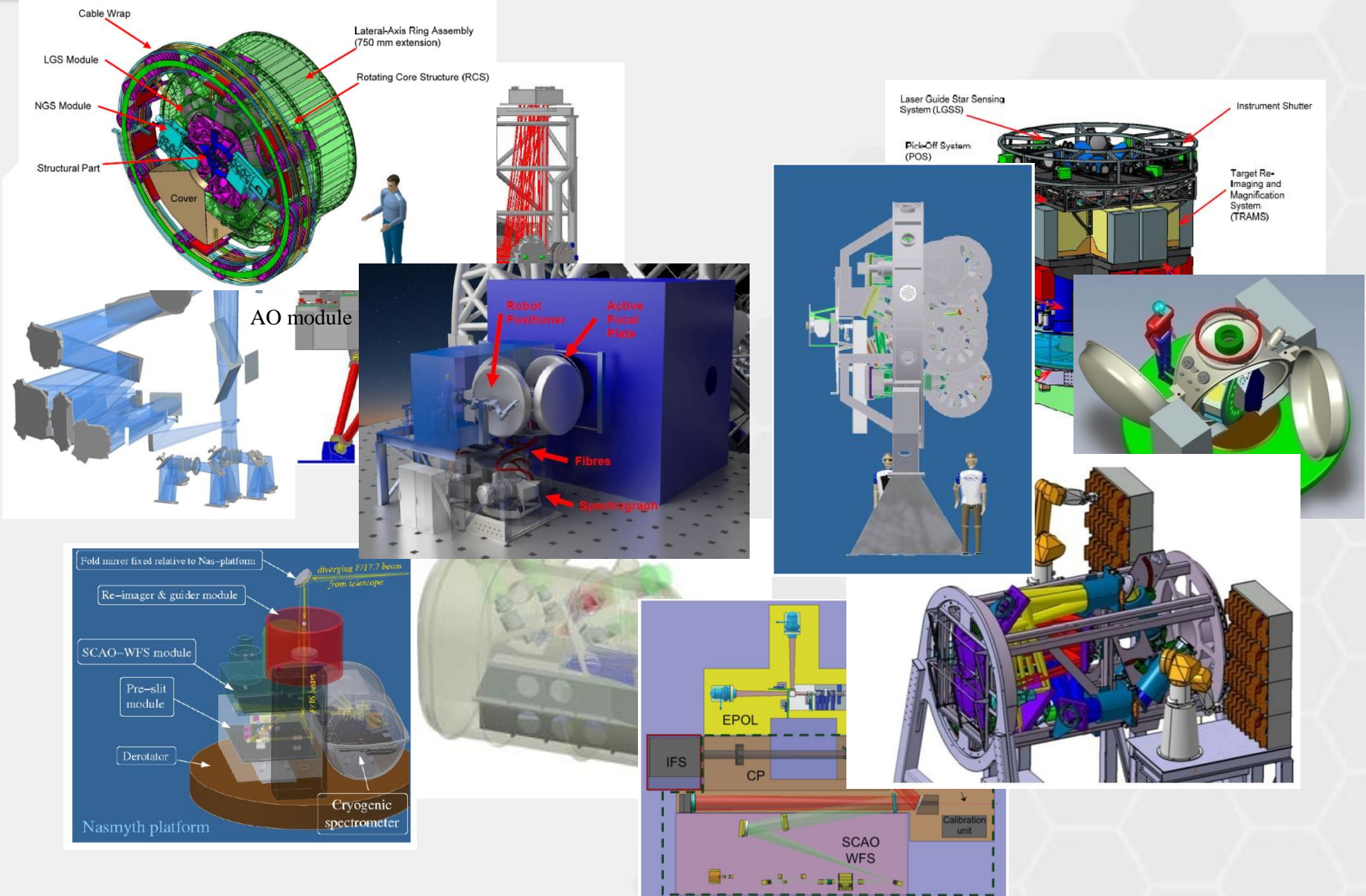




ELT Instrument Roadmap

Mark Casali





Selection process: criteria

ESO/COU 1275, December 2009

Nr.	Evaluation Criteria for E-ELT instrument selection
1	Scientific Merit : (a) the instrument addresses science goals identified as of highest priority for the E-ELT (b) the instrument can be conceived as an E-ELT workhorse to be used for a variety of programmes, leading to a broad spectrum of potential discoveries (c) the instrument will benefit and complement observations of other major facilities in astrophysics like ALMA and the JWST , which will be already in operation at the time of first light
2	Proven Technical Feasibility and Simulated Performance: the instrument feasibility and its expected performance have been properly demonstrated in the study
3	Affordability: (a) the instrument cost is well estimated and justified (b) the cost to ESO falls within or close to the preliminary budget envelope.
4	Timely Match to the telescope + PFAO performance: the instrument schedule of implementation is well matched to the path of the telescope +AO to full performance. The instrument includes the possibility to do prime science even during the time when the telescope cannot operate with AO.



Selection process: scientific priority

- Science based prioritisation
 - All instruments candidates for selection at first light with the exception of the planet camera and spectrograph, EPICS (highest scientific priority but long technology development)
- Science Working Group Criteria for selection of first light instruments
 - Scientific impact, including certainty of scientific return
 - Complementarity with other facilities
 - Scientific Flexibility
 - Coverage of expected observing conditions



Selection process: the instrumentation plan

- First light instruments
 - ELT-CAM: NIR diffraction-limited camera
 - ELT-IFU: NIR IFU spectrograph with optical-IR coverage and seeing limited to diffraction limited capabilities
 - ELT-MCAO (& LTAO): Adaptive optics systems as required to meet the science cases of each instrument
- A planetary camera/spectrograph with Extreme AO has high scientific priority and must be built once the technology is developed
- Instruments thereafter of equal scientific priority
 - MIR/MOS/HIRES



E-ELT Instrument Programme

2011 Approved Roadmap

year	ELT-IFU	ELT-CAM	ELT-3	ELT-4	ELT-5	ELT-6	ELT-PCS
2012	Decide science reqmts, AO architecture.		VISIR start on-sky	Develop science requirements for MOS/HIRES			Call for proposals for ETD
2013			Selection ELT-MIR/MOS/HIRES Call for proposals for MOS/HIRES				
2014							
2015				Selection ELT-MOS/HIRES		Call for proposals	
2016							
2017							TRL check
2018							TRL check
2019						Selection	TRL check
2020							TRL check
2021							TRL check
2022 Tel technical 1 st light							
	Pre-studies taking the form of Phase-A or Δ-Phase-A work and/or ESO-funded enabling technology development (ETD)						
	Decision point						
	Development of Technical Specifications , Statement of Work, Agreement, Instrument Start.						

slipped 6 months



E-ELT Instrument Programme

Approved Roadmap

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first-light Instruments 1 & 2

- ELT-CAM + ELT-MCAO
- ELT-IFU (+ LTAO)



E-ELT Instrument Programme

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- ELT-IFU (+ LTAO)

Instruments 3,4,5

- ELT-MIR
- ELT-MOS or HIRES



E-ELT Instrument Programme

Approved Roadmap

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- ELT-IFU (+ LTAO)

Instruments 3,4,5

- ELT-MIR
- ELT-MOS or HIRES

Instrument 6

- open



E-ELT Instrument Programme

Approved Roadmap

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first-light Instruments 1 & 2

- ELT-CAM + ELT-MCAO
- ELT-IFU (+ LTAO)

Instruments 3,4,5

- ELT-MIR
- ELT-MOS or HIRES

Instrument 6

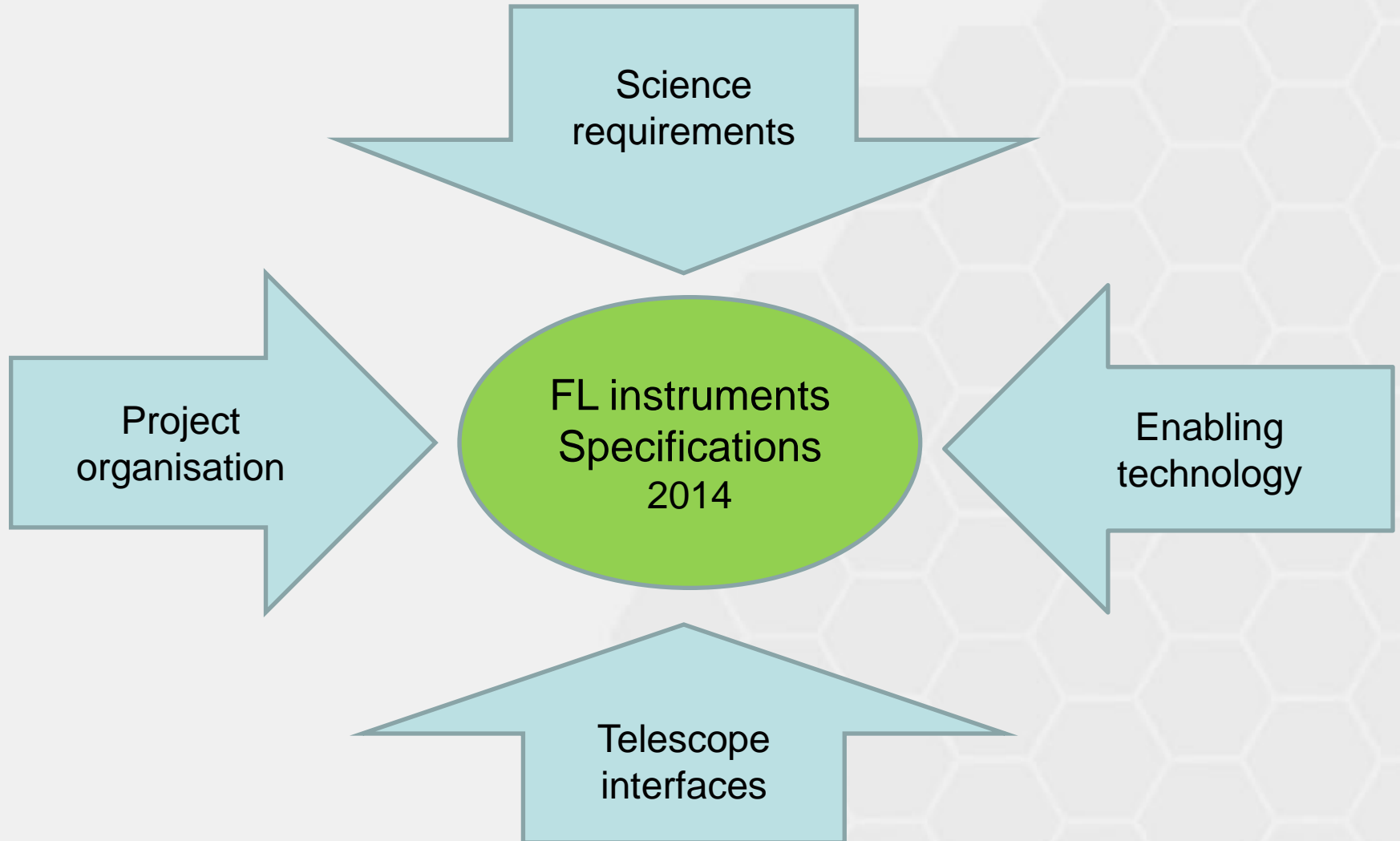
- open

ELT-PCS

- Tech development
- start at suitable TRL

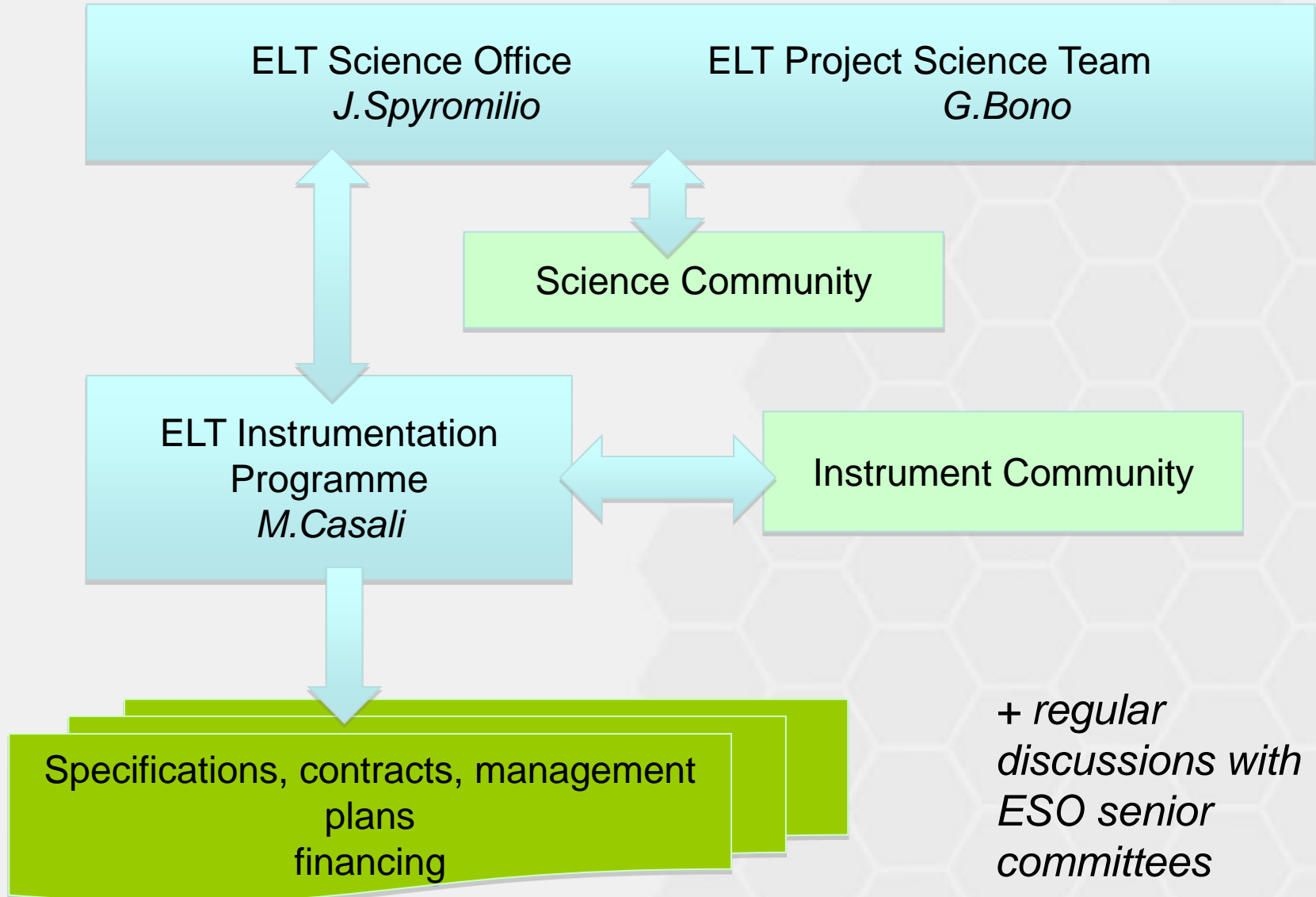


Current work



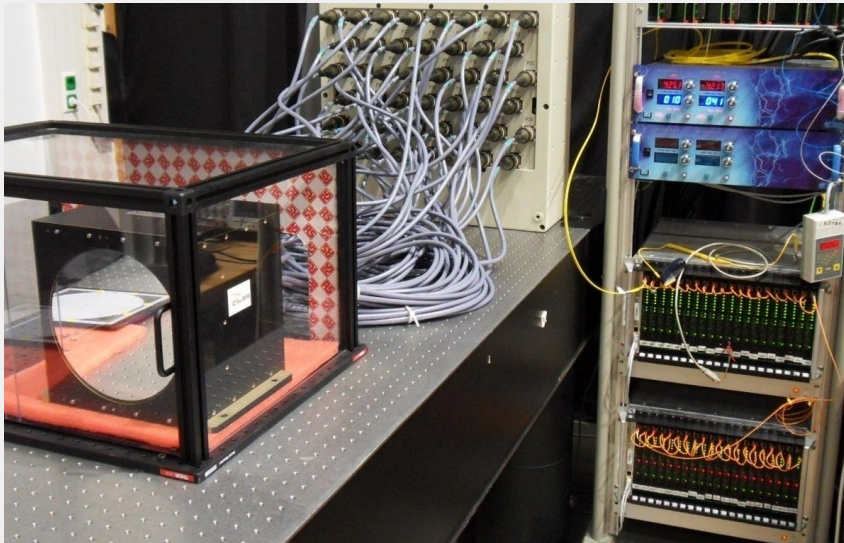


Science Requirements



Enabling technology

- Funding available to bring key technologies to sufficient maturity
 - Deformable mirrors
 - Detectors (both WFS and science)
 - High contrast observations (PCS)





Telescope Interfaces

- General requirements document under revision
- Cryo-infrastructure currently in design. Phase A review in 2013.
- Standard components (detector controllers, RTCs) under study. Reviews and conclusions late 2013.



Project Organisation

- Consortium organisation is key to success
- Management plans under discussion
 - Revision/discussion till agreement on both sides
 - Convergence by mid-2013. Subsequently SoW & Instrument specifications.
 - ESO Instrument management meeting “working together”
 - ⇒ Exchange of views, ideas, experience from both sides, methods for remote collaboration
 - ⇒ Early 2014



status

Instrument/ module	status	agreement
ELT-CAM	PI: Davies (MPE) PST Science requirements prepared Discussing organisation and PMP	2014
ELT-IFU	PI: Thatte (Oxford/ATC) PST Science requirements prepared Discussing organisation and PMP	2014
ELT-MCAO	PI: Diolaiti (INAF) Discussing organisation and PMP	2014
ELT-LTAO	TBD Still examining possible designs and interfaces	TBD



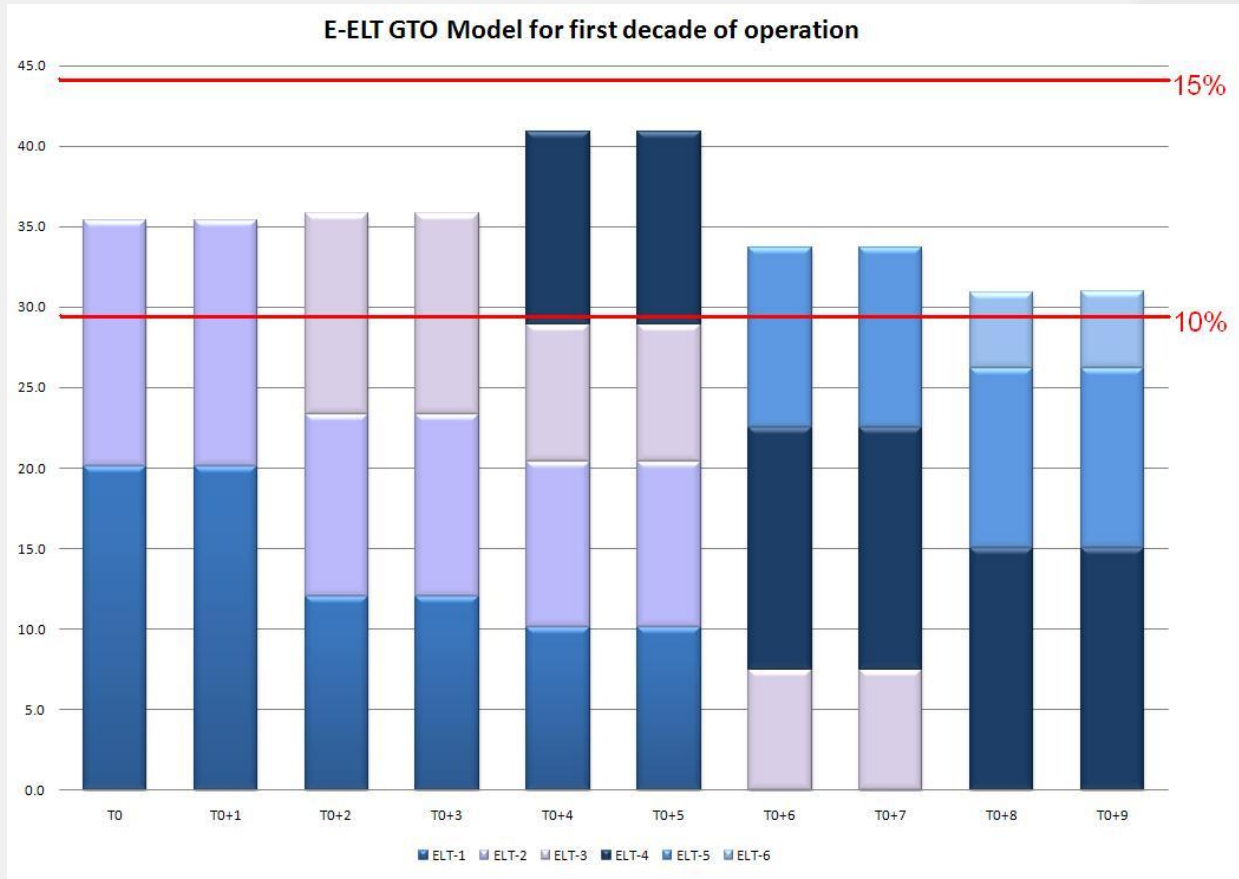
procurement

As stated in construction proposal.....

- Phase-A consortia will be contracted to take first-light instruments to construction subject to agreement on both sides regarding the project organisation.
- Subsequent calls will be competitive
- ESO will pay for capital costs
- Consortia effort will be compensated by GTO



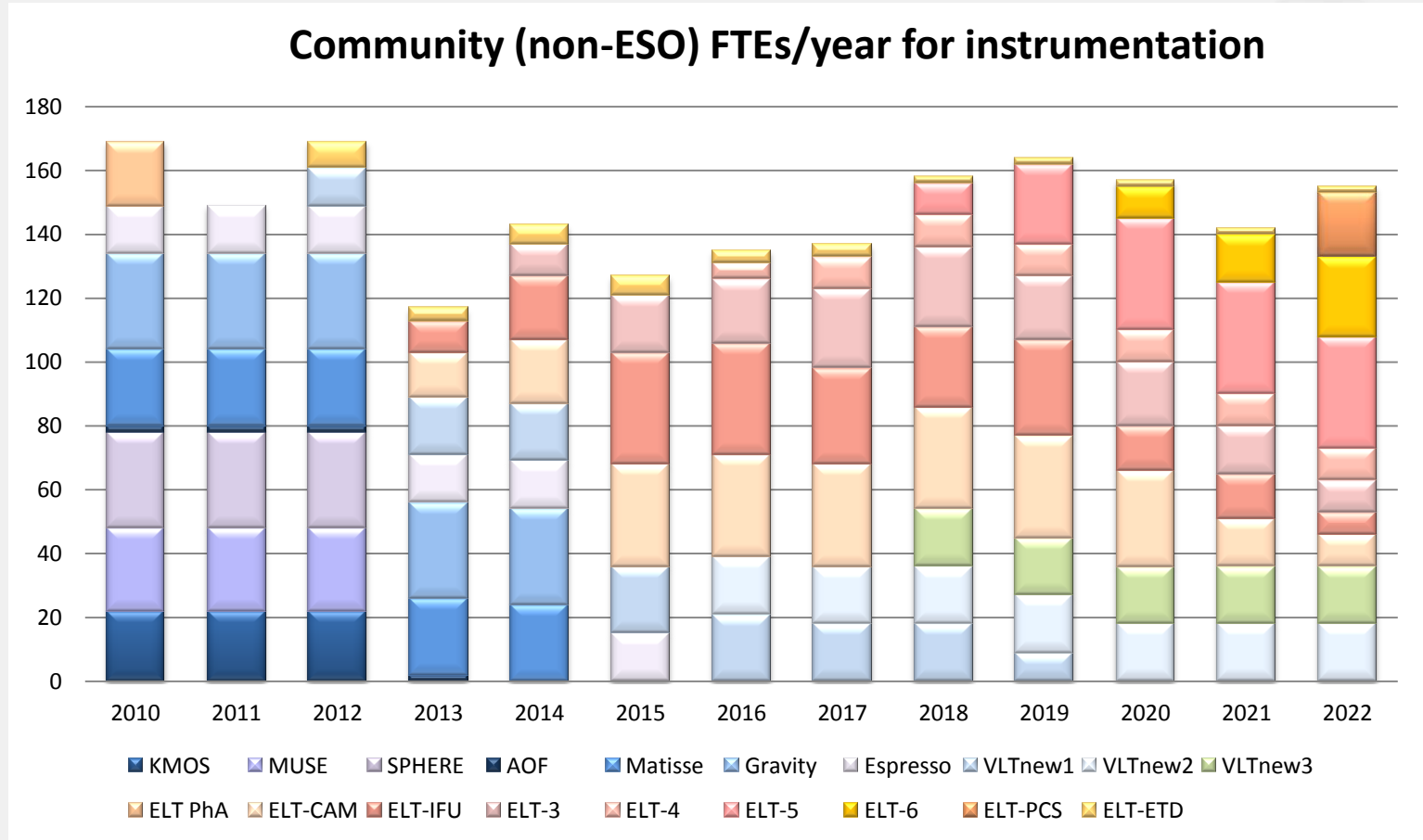
GTO availability



- GTO remains below 15%. Paper to council in 2010.



Community Effort and GTO



- Staff resources in the community are available at approximately the current levels of ESO commitment



END and Questions