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ELT GTO Funding of Instruments

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1. Summary

This document describes the use of GTO to generate additional funding for ELT instrumentation as approved by ESO Council at its June 2018 meeting.

This will allow in particular HIRES and MOSAIC to be delivered in a timely way, but also deal with some of the extra costs of the Phase 1 instrumentation and deal with some of the deferrals into Phase 2 of instrumentation capabilities. To achieve this Council has:

- Raised the GTO limit for the ELT from 15% to 20% for the first eight years of operations
- Allowed Member States to contribute to the hardware costs of instrumentation at a rate of 300 kEUR/night in 2015 EUR, indexed to the year of signature of the agreement using the official Council approved ESO budget indexation numbers, and
- Allowed non-Member State institutes to contribute to the hardware costs of instrumentation at a rate of 600 kEUR/night in 2015 EUR, indexed to the year of signature of the agreement using the official Council approved ESO budget indexation numbers.

2. The ELT GTO policy

The ELT GTO policy (ESO/Cou-1543 rev 2) was approved by Council in Dec 2014. Some of the pertinent features of the policy are reproduced below:

1. A maximum 15% of the total telescope time can be used for GTO
2. The default situation is that the GTO is only used to compensate staff effort and that ESO normally covers the hardware costs
 - a. The policy also allows the possibility to give GTO in return for hardware costs under *exceptional circumstances* i.e. where ESO does not have sufficient funding available to realise an instrument that is of scientific importance for the whole community and which enables a key scientific goal of the ELT
3. The GTO is awarded to the consortium (not to individual partners)
4. GTO Proposals are assessed by the OPC, and
5. The GTO is spread over a maximum period of eight years and up to 25% of the GTO can be used for complementary observations on other ELT instruments during that time.



3. Funding MOSAIC and HIRES with GTO

The model is that the consortia will get the standard 65 nights of GTO as compensation for all the labour to build the instruments. In addition, the consortia will raise the necessary funds to pay for all the hardware needed in return for additional GTO.

3.1 Involvement of non-Member States

The model is rather simple:

- Non-MS group(s) would join the Instrument consortium as a partner and would engage fully in the science programme
- All aspects of Council's GTO policy would be respected except that the 15% limit on GTO would be exceeded, and
- The exchange rate of hardware provision for GTO would be a factor of two higher than for a MS.

The exchange rate for non-MS for GTO is higher since the MS are taking the full risk of building the telescope.

3.1.1 Choosing non-Member State Partners

For any instrument consortium, it is important that the new partner brings both added value to the partnership and does not dominate the consortium. This argues for a series of partners each bringing a few MEUR rather than one or two huge partners per consortium. In any case it does mean that several additional non-MS partners will need to be secured.

The choice of non-MS Partners is clearly a pivotal issue in this scheme. There are obviously a set of considerations from the perspective of ESO and also from the perspective of the PIs. ESO also would like to give preferred status to organizations and countries with which they have an important relationship (examples would be the partnership with Australia, Brazil, and partners to other Programmes).

However, in the final analysis, these are partners for the instrument consortia. ESO can act as match-maker and make introductions and of course facilitate the deal, ESO will also have a veto, but *the consortium PI has the final decision*.



4. Phase 1 instrumentation and items of deferred scope

The GTO scheme allows external partners to also make a contribution towards Phase 1 instruments and some of the deferred items. The boundary conditions for the use of GTO for these additional items is the same; the funding partner must join the relevant consortium and be acceptable as a partner to the PI. It also means that the item of work must be something that can easily be associated with an existing instrument consortium – for example, the H-LTAO is associated with HARMONI and the two deferred lasers are associated with MAORY.

The Phase 1 instruments are already being built under signed agreements to completion. However, their statements of work allow at PDR an examination of any cost increases due to potential changes in the interface between the Instrument and the Nasmyth platform since the baseline agreed at the time of signature. They also allow a re-examination of the scientific scope since there are goals as well as requirements. Any cash contributions to the existing Phase 1 instruments that would be eligible for GTO would be limited to items that ESO would have paid out of contingency if there had been sufficient funding available – general underestimates will not be covered with GTO.

5. Stage gates

A stage gate process is foreseen to control the approvals of the projects. The first stage gate will be at PDR where the pledges and secured funds need to be sufficient to allow all parties to agree to move to FDR. A final stage gate at FDR is also foreseen which will be the go/no go point.

6. Providing Effort as well as cash

For ESO Member States, institutes are already allowed to be part of the instrument consortia. For a non-MS institute to join a consortium they will need to contribute cash under this GTO scheme.

Assuming that the non-MS institute has appropriate skill sets and the consortium need the effort, then they are allowed to provide FTEs to the consortia. They will not get any extra GTO for this effort, but get the right to share in the GTO awarded to each consortium to commensurate for their staff effort. This has to be agreed by the PIs. This is true for the Phase 1 instruments as well as MOSAIC and HIRES.

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