PrepSKA Workpackage 6: Deliverable 6.1

Preliminary Report on the Policy Survey of National Funding Agencies

This document represents Deliverable 6.1 from PrepSKA workpackage 6. It is a preliminary analysis of the data received in response to the survey of national funding agencies. It is a starting point for further work as information-gathering in WP6 progresses.

Preliminary Report on the Policy Survey of National Funding Agencies

WP6 Team, Science and Technology Facilities Council

1. Executive Summary

The Policy Survey aimed to better understand the Governance, Procurement and Funding aspects in anticipation of the construction phase of the SKA. This report analyses the Funding aspect of the responses received to extract the funding cycles of each country, the process for involvement in the SKA and to determine any dependencies, issues or constraints that could impact on that involvement.

The report is based on an analysis of 37% response rate each with varying degrees of information – depth and completeness. Reponses were received from the US, Canada, Australia, South Africa, New Zealand, France and the UK.

Invariably, a decision to be involved in the SKA needed to be made at a government level. A distinction is made in the report between budget planning cycles and the planning horizon. The budget planning cycles for the countries analysed varied between 1 to 3 years and tended to represent the length of time it takes for each country to commit to funding a major project from the submission of a business case. The exception to this norm is the US. It does not include the time taken to develop the business case.

Some of the survey responses identified that a solid business case with strong science drivers prioritised within each country's own macro-economic agenda was important. Other issues such as competition from E-ELT and greater clarity on the commitment of potential partners to the SKA were also a source of concern.

The analysis concluded that the budget planning cycles of the countries analysed did not realistically appear to coincide with the expected end of PrepSKA activities and when Phase 1 funding approval was needed in 2012. The level and availability of information required to create the business case or proposal therefore depends on each country's requirements. This and a further investigation of the integration of the budget planning cycles is intended to form the basis of further discussion with the country representatives to define the optimal funding profile options for the SKA.

2. Introduction

As part of the global efforts to develop the design concept for the Square Kilometre Array (SKA) telescope, the EC part-funded Preparatory Phase activity, PrepSKA, aims to develop possible models for the governance, procurement and funding profile of the project in anticipation of the construction phase.

A critical element of this work is to obtain information and views from international partners interested in the SKA concept and identify lessons learned from the experiences of other large infrastructure projects, operating now or under development. The first stage of this process is to seek inputs from the various funding bodies currently expressing an interest in the SKA programme. The key objectives of the Survey are to understand:

- The processes in each agency or government for decisions on involvement in large scientific projects
- The political and top-level funding cycles within each participant agency or government and how they might apply to the funding stream for the SKA construction phase
- Issues, opportunities and concerns that should be considered in the development of governance, funding and procurement models for the SKA through PrepSKA

The Policy Survey questions can be seen in Appendix 1.

2.1. Report Objectives

This is a preliminary report on the analysis of the responses received from Policy Survey of National Funding Agencies expressing an interest in the SKA. It forms part of the first formal WP6 deliverable as part of the PrepSKA project. The main focus of the report is on the Funding aspect of the Survey to understand in more detail:

- Funding cycles of each country
- The process for involvement in the SKA
- Any threshold issues that can affect involvement

2.2. Assumptions

The assumptions used in the analysis of the Survey responses are:

- The SKA timeline dated 25th November 2008 is used (Appendix 2).
- Phase 1 Funding Approval is sought from 2012.
- PrepSKA activities end at the same time Phase 1 funding approval is sought i.e. 2012.
- Each country's maximum funding cycles are used.

2.3. Survey Statistics

Varying degrees of information from the Survey in terms of completeness of the response were received. Whilst most responses have made an attempt to answer the questions asked, the degree of clarity and quality differs. Consequently, it should be expected that a follow up to the Survey is a necessary adjunct to the process of integrating the funding cycles and processes of each country into the timeline for the SKA.

The Survey was sent to 19 country representatives in the PrepSKA community via email. Of those 19, we have received 7 responses to the Survey to varying degrees of completeness. We expect to receive around 6 more responses within the next month.

Analysis is based on a 37% response to the Survey. We note that the partial response, missing several key potential partners, presents a risk to the quality of the analysis and ongoing assumptions from this point, but hope that further inputs will be received as the work continues.

Table 1: Funding Questions Answered

The distribution list is shown below and is also available on the WP6 wiki. The full responses to the Survey can be found on the WP6 wiki.

Table 2: Distribution List

Sent To	**Agency/Organisation**	**Country**	**Responded**

Country	**Qu 1 Part 1**	**Qu 1 Part 2**	**Qu 2 Part 1**	**Qu 2 Part 2**	**Qu 3**	**Qu 4**	**Qu 5**	**Qu 6**
South Africa	Yes	No	Yes	Yes	No	No	No	Yes
Australia	Yes	No	Yes	Yes	No	Yes	Yes	Yes
New Zealand	Yes	No	Yes	Yes	Yes	Yes	No	No
US	Yes	Yes	Yes	Yes	No	No	Yes	No
UK	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Canada	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
France	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Simon Berry	STFC	UK	Yes
Jean-Marie Hameury	CNRS	France	Yes
Greg Fahlman	NRC	Canada	Yes
Vern Pankonin	NSF	USA	Yes
Bernie Fanaroff	NRF	South Africa	Yes
Martin Gallagher	DIISR	Australia	Yes
Andrew Watson	MORST	New Zealand	Yes
Luis Ruiz		Spain	No
Ugrinovich		Russia	No
Tezon		Argentina	No
Makoto Inoue	NAOJ	Japan	No

Franz-Josef Zickgraf	BNBF/PT-DESY	Germany	No
Corrado Perna	INAF	Italy	No
Patricia Vogel	NWO	Netherlands	No
Bo Peng	BAO	China	No
Sang-Sung Lee	KASI	Korea	No
Domingos Barbosa	IT	Portugal	No
Yashwant Gupta	NCRA	India	No
Hans Olofsson	Chalmers	Sweden	No

3. Analysis

As expected, the process required by each agency to approve their involvement in the SKA is varied for each country. The analysis attempted to capture the process for agency involvement, the funding cycle and budget planning dates. For a summary of the funding cycles, see Table 3. For a summary of the answers to each Funding question received per country, see Appendix 3.

3.1. Process

Overall, each country's decision process for involvement in the SKA identified the need for submission of a valid business case or white paper with strong scientific drivers coinciding with the start of their budget planning cycle. All of the responses received indicated that due to the level of funding needed, the decision to be involved in the SKA tended to be made at the Cabinet, Parliamentary or Congress level.

An overview of the process tended to follow the generalised:
1. Development and submission of a business case or white paper.
2. Prioritisation against other proposals.
3. Consideration against the country's own economic priorities.
4. Finally, a decision to be involved in the SKA.

Two key elements clearly emerge from this analysis. These are the need:
- *For high level engagement, as already identified by the IFAG/ASG group in its earlier discussions, in order to progress the movement towards a commitment.*
- *To identify at an early stage the requirements and definition of each potential participant in developing a 'business case'.*

3.2. Funding Cycles

Perhaps one of the most important distinctions the Policy Survey should have made in its development was the difference between the budget planning cycles and the planning horizon for large science projects.

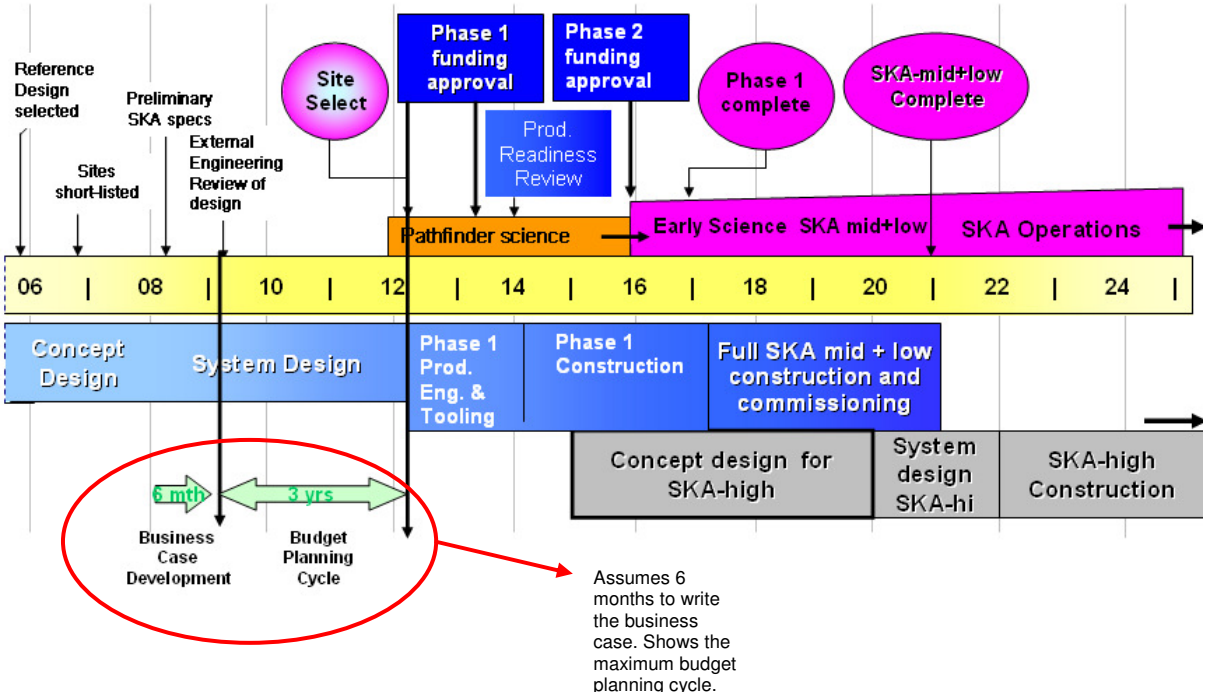
For the purpose of this report, we take the budget planning cycle to mean the period of time from the submission of a business case for involvement in the SKA to the point where it is decided that the country would be involved. From the responses analysed, budget planning cycles tended to be anywhere from a yearly to a 3 year cycle.

The definition of the planning horizon we take to be the terminology used in the Survey responses to refer to the period of time where the country concentrates on a shortlisted science programme including a prioritised range of large research projects in which it would consider investing.

The noteworthy exception is the US process for a decision to be involved in the SKA. We note that a white paper for the SKA has been submitted by the US SKA community to the US

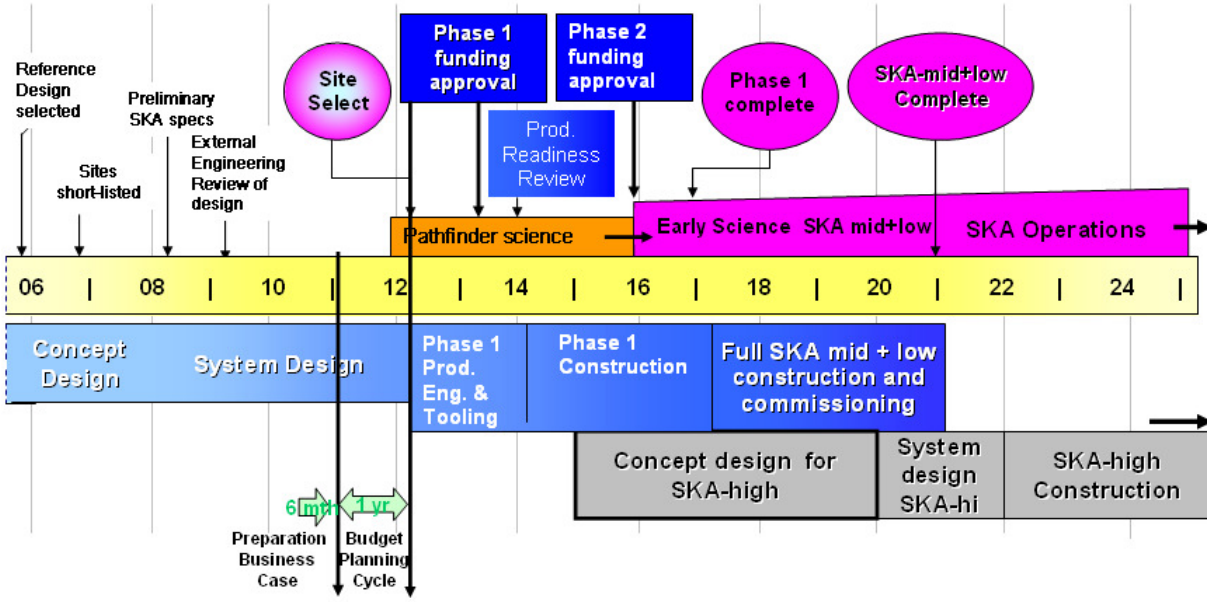
Decadal Survey. This is one of many inputs to the Decadal Survey to guide them in setting priorities for science and facilities over the next decade. The Decadal Survey plans to issue their report in mid 2010. The Decadal Survey will not make any decisions on new facilities, they only make recommendations. In order to even consider SKA for funding, the NSF will need a fully developed and detailed proposal (from the community). Putting this proposal through NSF's stringent evaluation process and criteria can take several years and having such a proposal ready for NSF is unlikely until 2013/2014.

The following diagram shows the impact of a 3 year budget planning cycle for countries such as the UK on the SKA timeline. If the maximum budget planning cycle is integrated in the SKA timeline in order to coincide with Phase 1 funding approval, we become concerned with the practical logistics that emerge:



What this diagram tells us is that to meet the Phase 1 funding approval date around 2012, countries such as the UK and France need to be applying for funding now with a business case or proposal or white paper already submitted. The US involvement is not expected to begin before 2015/2016 although funding for detailed design and development may be possible on an accelerated time scale..

The following diagram shows the impact of an annual budget planning cycle for countries like South Africa and Canada on the SKA timeline:



From this diagram, the preparation of the business case/must begin around mid 2010 in order to coincide with a decision process for Phase 1 funding approval. This is a more realistic expectation but there are a number of dependencies which require consideration.

From a practical point of view and considering that all PrepSKA work packages are not expected to deliver until the end of 2012, the budget planning cycles of each country analysed do not appear to realistically coincide with the time identified for Phase 1 funding.

3.3. External Factors

As with most countries, there are a number of external factors which affect the planning process and involvement in the SKA. External factors could either be macro-economic factors (even more relevant in the current global economy) or department/agency interdependencies. As expected, the Survey responses varied in respect of these factors with some responses not even addressing the question.

There is recognition however, that there is a subtle interaction between working to a solely scientifically driven decision process and one driven by a particular cost model.

Ultimately, it is clear that we should be mindful that in the current climate, political and economic pressures may take precedence over scientific endeavours.

3.4. Summary of Processes

Table 3: Summary of Funding Cycles and Process

Agency/	Funding	Process	Budget

Country	Cycle		Planning: Start-End
STFC, UK	1- 3 years	The Research Councils publish a Roadmap of large infrastructure projects to help inform strategic investment in large facilities. The Roadmap includes national and international projects, within the UK and elsewhere. Inclusion in the UK's Large Facilities Roadmap is the first requirement for large capital projects to be considered for funding from the DIUS Large Facilities Capital Fund (LFCF); it must also satisfy a number of criteria including having capital costs over £25 million. The SKA is on the current Roadmap. It is important to note that in many cases the Research Councils' involvement is dependent on the outcomes of preparatory phase studies. The LFCF, its size typically £100 million per annum, was established to support Research Councils' investments in large research facilities, both national and international, with capital funding that could not be sensibly accommodated from within Research Council budgets. The approval process, managed by the Research Councils, followed before funding is formally committed and released by DIUS is broadly: • Prioritisation of the use of the LFCF budget • Allocation of resources through the LFCF • Preparation of the Science Case and Business Case • Consideration by DIUS of the Business Case and submission to Ministers for approval of the commitment of fund From making it on to the Roadmap to securing funds can take up to three years, but no less than 12 months	?
CNRS, France	1 - 2 years	A project such as SKA has to be approved at the ministerial level. This requires that SKA appears as the highest ranked project in astronomy before being submitted to the ministry. Beside a strong support from the scientific community (both national and international), there will be expectation of a significant industrial return. A formal government decision can be expected on a timescale of 1-2 years at best.	?
NRC, Canada	1 year	There is no defined process or policies in Canada dealing with the submission of proposals or funding for major science investments of any kind. Government departments and agencies prepare Memoranda to Cabinet (MC) outlining their requests for new funds for whatever purpose, including construction of facilities. This is done on an annual cycle to match the annual Budget prepared by Government. NRC must secure the permission of the Minister of Industry in order to submit an MC.	

NSF, USA	1.5 – 2 years	Decadal Review 2010-2020 underway. SKA must receive a high priority endorsement by ASTRO2010 before the NSF can consider funding. Funding would be through the Major Research Equipment and Facility Construction (MREFC) account. A formal SKA proposal is required and must meet the MREFC criteria. The proposal then enters a queue. However, it can be several years before approval is granted by the National Science Board. A request is then made to Congress to fund the project. No guarantee even after acceptance that funding would happen.	Started – Mid 2010
NRF, South Africa	1 year	The funding from the Treasury to the Department of Science and Technology (DST) is voted annually by Parliament. Treasury develops and Parliament approves a rolling three year Medium Term Expenditure (MTEF), which in effect commits funding over a three year horizon and is updated annually. The DST decides on the basis of its own programmes and priorities, as well as submissions from agencies which report to it like the NRF, what will be submitted to the Treasury annually for both the MTEF and the annual budget vote. Treasury requires that departments ring-fence infrastructural and operational funding, which can only cross boundaries if approved by Treasury and voted in the annual Adjustment Budget. The Northern Cape (NC) government makes submissions to the Treasury in a similar way for the SKA project. The DST and NC submissions are cross-referenced. The Treasury submits the MTEF and annual budget votes to Parliament. Parliament can approve or reject Money Bills, but cannot amend them. By the time budgets have been through the Treasury and its inter-Ministerial Committees, it is very unlikely that they would be rejected. However, the competition within Treasury is intense - the total of submissions from departments and provinces always far exceeds the amount available.	?
DEST, Australia	1.5 years	Considered on a case-by-case basis by the Australian Government through its cabinet processes. Normally, this is within the annual budget cycle. The Budget of the Australian Government is usually announced in May. Budget preparations begin around September of the preceding year.	September - May (following year)
MORST, New Zealand	1 year	Funding decisions linked to the annual Government Budget which is read in May. The NZ Government FY commences on 1st July.	? – May (following year)

4. Threshold Issues

The following are a number of issues or areas that were captured from the responses that require further clarification:

1. A cost-benefit analysis for involvement in the SKA will have to be assessed against each country's economic drivers and priorities.

2. Emphasis on the science drivers behind the SKA remains the motivation behind the decision to be involved in the SKA.

3. Acknowledgement that any cost models produced can stand up to rigorous external scrutiny on the required timeline given the available effort.

4. Globally, care will be required in phasing SKA with other similar scale astronomy projects such as the E-ELT in Europe, planned on similar timelines.

5. Clarification of the US involvement in the SKA must be clear as well as that of all other major partners.

6. Concerns over the timescales for delivery of SKA Phase 1 and specifically what happens between PrepSKA and Phase 1 Construction. There are suggestions that an Administrative Lead Time and an Engineering Preparation Phase is needed before Phase 1 Construction can begin.

5. The Next Steps

The next steps for the WP6 team is therefore to build on this report to capture how each country's planning cycles can be optimised to fund the construction of the SKA. The following issues will be investigated:

From country representatives:

1. Explore the specific dates of the budget planning cycles
- Start and finish dates
- Length of time to develop business case
- When the process needs to begin to fit with the SKA timeline

2. Determine the requirements for development of the business case
- What information is required
- Who prepares the business case
- How the WP6 can support the development of the business case

3. Understand in more detail any 'showstoppers' in developing the funding model
- Are there any major difficulties that could impact contributions to the SKA
- Investigate reality rather than process

From PrepSKA WP Leaders:

1. Integrate any new SKA timeline in the process. A new timeline was proposed in the SKA forum in Cape Town February 2009.

2. Investigate the options for staggered funding as opposed to a flat profile approach – optimisation of funding. This depends on the capital needed to construct the SKA and when.

3. Other issues to consider are post PrepSKA activities, Administrative Lead Time, Engineering Preparation Phase Development etc.

We expect discussion of these points to be on the agenda for some Core Group and Coordination Group meetings.

6. Conclusion

Based on the partial response to the Policy Survey, the Survey points to a significant risk to achieving Phase 1 funding approval on the current SKA Timeline. There are a number of risks to the timeline not the least of which is slippage. In this case, adequate notice of slippage is should be signalled on a very solid basis and with the close involvement of the Agencies SKA Group.

It is the view of the Agencies SKA Group that a robust timeline, taking a comprehensive account of the current situation, the Policy Survey and how and when a feasible core of Phase 1 partners might emerge, should be developed.

Other dependencies include the availability of sufficient information to inform the business case, white paper or proposal that forms part of each country's budget planning process. PrepSKA is expected to deliver this information by 2012. It is noted, however, it is not impossible to begin the process, but the completeness of the information required can only be determined by each country's individual requirements. This is expected to become clearer in future discussions with each of the country representatives.

Appendices

Appendix 1: Policy Survey Questions

General statement of current involvement

Please describe your department's or agency's current involvement (financial, technical, other) in the developing SKA programme, in either of:

- R&D and 'Pathfinder' activities
- PrepSKA

If applicable, please provide the contact details for individuals responsible for governance, funding and procurement policy related to large scale (astronomy) research facilities or programmes within your organisation.

The following sections are divided into the three broad policy areas of **Governance**, **Procurement** and **Funding Processes**. Please provide as much information or input as you feel able to.

Governance

The leaders of PrepSKA WP4 (Governance in the SKA) have identified several possible models for detailed consideration in studying potential governance models for the SKA. These are:

Based on national law	Limited liability company (for example ESRF)
	Unlimited liability company (XFEL)
	Foundation
Based on international law	International organisation (CERN, ITER, ESA)
	International body based on non-binding Memorandum of Understanding

1. A list of large-scale science facilities that will be approached for detailed study in this work is appended at Annex A. Are there additional large-scale facilities or governance models as listed in the table above which should be considered as relevant to the SKA, and why?

2. In which of these large-scale facilities does your agency or government participate?

3. Are there specific issues that you would like to highlight with respect to the governance and legal models of these facilities because of their relevance for the governance of SKA?

4. Are there formal impediments with respect to the participation of your agency to some particular governance and legal models?

5. What particular model should we consider for developing the governance of SKA?

6. Current governance and actors in SKA: what organisations are currently engaged in SKA developments in your country, who are the actors?

Procurement

1. What issues or regulations are there for large international science project procurement in your agency or department? Are there significant differences according to the phase of the project, such as design, construction and operation?

2. Would any particular procurement model or requirements be of importance in considering investment in the SKA?

Funding

1. In as much detail as possible, what are the processes required by your department or agency to approve involvement in a large science infrastructure project such as the SKA? What external (for example outside the definition of science strategy) factors may affect those processes and the decisions?

2. The international SKA project has proposed a detailed timeline (appended at Appendix 2) for the construction and operational phase of the project. In your view:

   - Would this fit with the known decision and funding and process cycles required for your department or agency?
   - Are there any particular issues or constraints that need to be resolved first?

3. What alternative funding sources for SKA should be considered? What support and/or mechanism(s) are available within your department/agency to provide access to such funding sources (e.g. industrial/collaborative schemes)

4. What funding policies would you consider appropriate for the SKA project? In particular:
   - For managing partner funds?
   - For accessing alternative funding (e.g. industry)
   - For dealing with cash and in-kind contributions?
   - For accessing contingency?
   - For anything else?

5. Are there lessons to be learned from other projects or programmes on the development of a funding model for the SKA? Which projects/programmes should we talk to in order to understand these lessons?

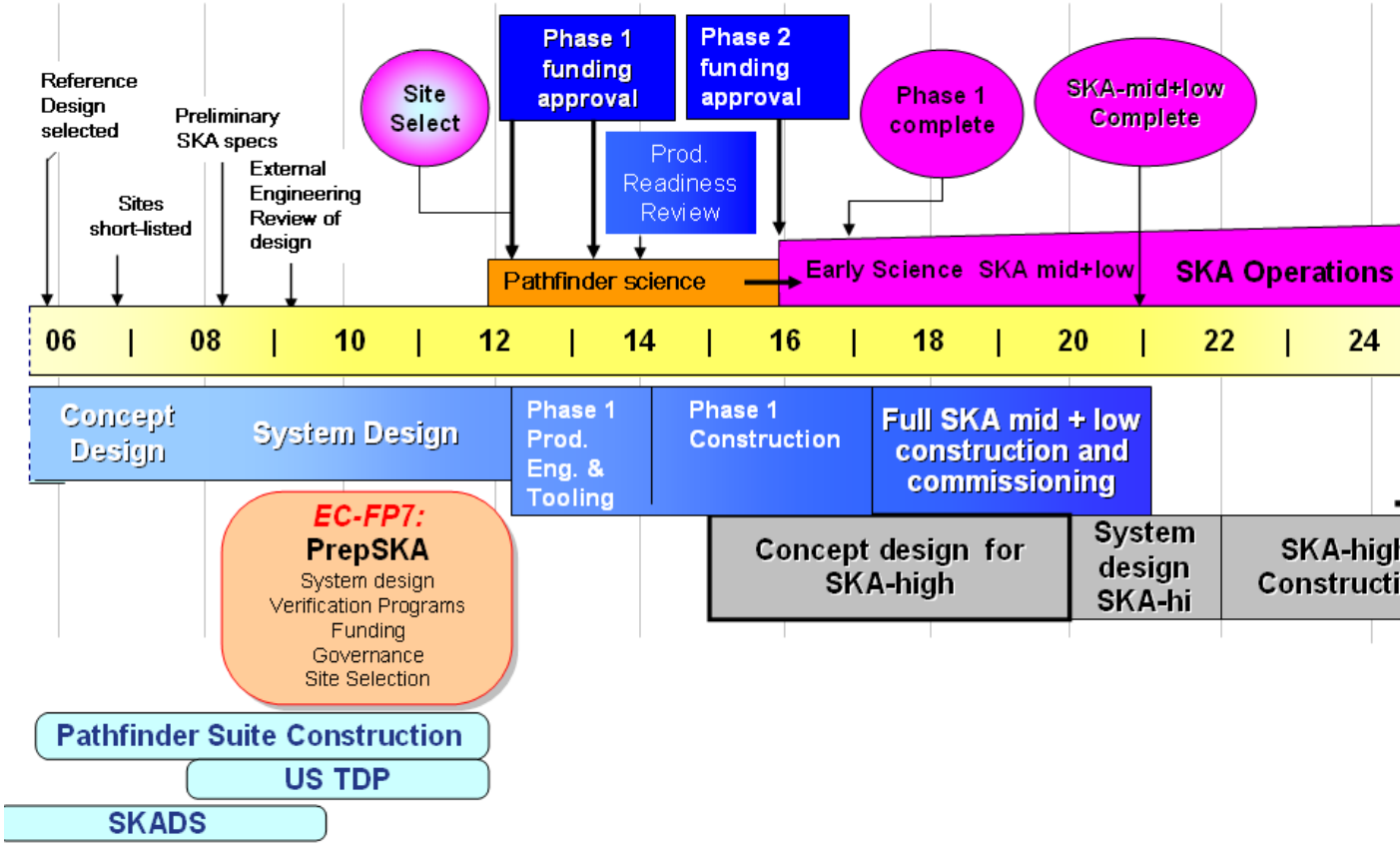
6. One option being investigated by the PrepSKA programme is the possibility of an EIB loan to facilitate financing of the project. What is your opinion of this option and would it be acceptable to your agency or department?

Annex A

Our objective is to study a limited number of governance models, to assess their applicability to the SKA case. To this purpose, we have compiled the following long list of large scale facilities:

- CERN
- ITER
- ALMA
- GEMINI
- ESRF
- ESO
- ESA
- INTELSAT
- Anglo-Australian Telescope (AAT)
- ATLAS
- ILC

Appendix 2: SKA Timeline



Appendix 3:

Agency/ Country	Question 1 Part 1	Question 1 Part 2	Question 2 Part 1	Question 2 Part 2	Question 3	Question 4	Question 5	Question 6
NRF, South Africa	The funding from the Treasury to the DST is voted annually by Parliament. Treasury develops and Parliament approves a rolling three year Medium Term Expenditure (MTEF), which in effect commits funding over a three year horizon and is updated annually. The DST decides on the basis of its own programmes and priorities, as well as submissions from agencies which report to it, like the NRF, what will be submitted to the Treasury annually for both the MTEF and the annual budget vote. Treasury requires that departments ring-fence infrastructural and operational funding, which can only cross boundaries if approved by Treasury and voted in the annual Adjustment Budget. The Northern Cape government makes submissions to the Treasury in a similar way for the SKA project. The DST and NC submissions are cross-referenced. Treasury submits the MTEF and annual budget votes to Parliament. Parliament can approve or reject Money Bills, but cannot amend them. By the time budgets have been through the Treasury and its inter-Ministerial Committees, it is very unlikely that they would be rejected.	Not explicitly stated.	Given the processes, the SKA timeline does not introduce any problems.	The competition within Treasury is intense - the total of submissions from departments and provinces always far exceeds the amount available.	Not answered	Not answered	Not answered	The DST and SASSC have no objection to an EIB loan and have i fact investigated this option. The problem is finding a revenue stream over 20-25 years which will repay the loan. In the case of a multi-national project, this would not be a problem, because countries would presumably commit annual funding over a long period (as with ESO).
DEST, Australia	Large-scale research infrastructure funding possibilities are considered on a case-by-case basis by the Australian Government through its cabinet processes. Normally, this is within the annual budget cycle. The Budget of the Australian Government is usually announced in May, with the budget preparations beginning around September of the preceding year. The development of the business case, together with the Government's consideration in the usual budget cycle, means that large scale research funding proposal (>AUD $50 m) requires around 18 months to reach a decision.	Not explicitly stated.	The ASCC considers that Australia's public policy decision processes can accommodate the current international SKA project timeline.	Not with respect to the ASCC.	Not answered		The ASCC notes that there is a wide range of just retour approaches, ranging from very prescribed arrangements (as with ITER) to more flexible arrangements, as appears to be the case with Gemini and Galileo. The ASCC considers that if just retour approaches are considered for the SKA, flexible arrangements are less likely to inhibit project efficiency and should be given careful consideration.	The ASCC would welcome more detail about the options provided by an EIB loan but has doubts about the approach.

MORST, New Zealand	A government Cabinet decision is required once an investment case has been developed. Development of an investment case would require a substantial cross-government process. Funding decisions linked to the annual Government Budget which is read in May. The NZ Government FY commences on 1st July.	Not explicitly stated.	Yes	Yes. A number of assessments are required to be completed: economic cost-benefit analysis; fit with New Zealand science infrastructure priorities; development of an investment case; New Zealand hosting arrangements.	A range of competitive government schemes are available to support R&D activities in New Zealand. Appropriate SKA technology development projects could be supported by these schemes if the required R&D capability exists in New Zealand. As well as supporting collaborative R&D activities and some level of infrastructure support, New Zealand is interested in using its geographical location to enhance an Australasian based SKA by hosting SKA stations. Should the government agree to host stations, then the use of crown land and government legislative support to facilitate SKA development in New Zealand would constitute significant additional support.	Full transparency and accountability against a clear budget document.	Not answered.	Not answered.
NSF, US	SKA must receive a high priority endorsement by ASTRO2010 before the NSF can consider funding. Funding would be through the Major Research Equipment and Facility Construction (MREFC) account. A formal SKA proposal is required and must meet the MREFC criteria. The proposal then enters a queue. However, it can be several years before approval is granted by the National Science Board. A request is then made to Congress to fund the project.	US Decadal Review, Astro2010, Congress	No. This is an issue that needs to be worked extensively during the course of WP6 and the Agencies SKA Group.	Many.	Not answered.	Not answered	Supports information gathering for identified projects.	Not answered.
STFC, UK	The Department for Innovation, Universities and Skills (DIUS) is responsible for UK science policy and for funding basic research through the UK's Research Councils, to which it delegates authority for approving and managing science delivery. The UK Office of Government Commerce's (OGC) Gateway Review Process is mandatory for all its major new programmes and projects. It examines programmes and projects at key decision points in their lifecycle and provides assurance to management on whether a project can progress successfully to the next phase.	Before a new project <£25 million can be considered for funding by the STFC, the need or concept must be submitted for review and evaluation in the form of a Statement of Interest (SoI), often known as a Strategic Business Case. Once a decision is taken to develop a	In principle, yes. However UK Government funding cycles, while normally following a 3-yearly (i.e. CSR) cycle are subject to whole of government issues and the cycle can sometimes change unexpectedly (e.g. where there is a financial	Yes. Different issues and constraints are associated with matching the SKA spend profile, which is largely driven by technical design work, with the likely contribution profiles of funding agencies and partners. These will need to be explored further.	(1) Private Finance Initiative / Public Private Partnerships (PFI/PPP). All proposed major investment projects can be considered for PFI/PPP but expert advice is taken on a case by case basis. (2) (ii) Joint Venture company (e.g. DLS). DLS has been set up as a public/private venture – a variation on the above public/private partnership model. (3) (iii) Industrial Collaborative funding. The UK's Technology Strategy Board (TSB) is jointly supported and funded by DIUS and other Government Departments, the Devolved	A policy needs to be devised by which in-kind contributions can be scored alongside cash contributions. Such models exist in different international laboratories (e.g. CERN, SLAC, DESY) which could be used to arrive at an appropriate level. Contingency issues to consider: • How do we decide what contingency is needed? • Who holds it and how is it released? A particular issue in advance of	Yes. As with governance models there are a number funding options from which to choose. At this point in time it is envisaged that discussions will be held with the same organisations being targeted by WP4 – Governance.	This option is worth exploring. STFC has taken the lead in initiatin dialogue with the EIB on support fo large infrastructure projects. Initial fact-finding indicates that EIB offers a range of loan models to enable project partners to be able to move forward at the same speed.

		concept into a formal project, a detailed scientific and business case has to be developed so its feasibility can be further evaluated and the project's scope, schedule and cost optimised. For Capital Investment projects >£25 m, inclusion in the UK's Large Facilities Roadmap is the first requirement for large capital projects to be considered for funding from the DIUS Large Facilities Capital Fund (LFCF); it must also satisfy a number of criteria including having capital costs over £25 million. The ELT and SKA are both on the current Roadmap. It is important to note that in many cases the Research Councils' involvement is dependent on the outcomes of preparatory phase studies.	downturn).		Administrations, Regional Development Agencies and Research Councils. It supports and invests in technology research, development and commercialisation.	establishing a multi-lateral agreement and/or SKA organisation. • What can it be used for? (i.e. it is not there to compensate for poor costing). • At what point do we consider de-scope or project cancellation.		
NRC, Canada	The Government of Canada has very stringent policies related to cash transfers from a department or agency of Government to a third party. The	The key factor in a decision to support	The SKA time line is very aggressive	Apart from the internal project-level issues affecting the SKA time-line, the most	Universities work through the Canada Foundation for Innovation (CFI) to procure	Although ALMA is teaching us all many lessons, one that is	Given the difficulty we have of transferring cash, the SKA funding policies should have the	The notion of borrowing money fro the EIB to finance the whole projec or to ease the cash flow

	Government Agency involved (e.g., NRC) would have to prepare a submission to Canada's Treasury Board (a subset of Cabinet ministers) defining the terms and conditions of the transfer payments, including a specification of eligible costs. There is no defined process or policies in Canada dealing with the submission of proposals or funding for major science investments. Government departments and agencies prepare Memoranda to Cabinet (MC) outlining their requests for new funds for whatever purpose, including construction of facilities. This is done on an annual cycle to match the annual	construction of a large facility like the SKA is economic return to Canada. Budget prepared by Government. NRC must secure the permission of the Minister of Industry in order to submit an MC.	given the project organization and funding situation.	serious challenge faced by the SKA is competition with the next-generation of large optical telescopes: TMT and ESO's ELT. However, the balance between SKA and E-ELT remains very delicate. In the Canadian context, TMT construction has been delayed, potentially causing a phasing problem for SKA funds. If a delay strikes the E-ELT, it is very likely that the SKA time-line will have to be reconsidered.	funds for large infrastructures. The CFI rules preclude Government agencies like NRC form accessing those funds. The CFI typically funds only 40% of eligible project costs with the balance to be raised from other sources; generally the Provincial Governments of Canada, the private sector and federal departments and agencies (contributions can be "in-kind"). While CFI contributes capital and may provide some short-term operations funding, it generally does not fund on-going operations. There is no defined source for operations funding for non-government facilities. In addition to CFI, the university community may lobby government for directed funding, either through an existing channel or to create a new one. In the past, the Canadian Government has set up and funded special purpose "foundations" to pursue research aims.	surely foremost is the very intense level of attention required by the Funding Agencies and their managers to keep such a big project on time (schedule and personnel management) and on budget (financial management).	ability to accept "in-kind" deliverables. The cost estimates for the SKA need to be sufficiently detailed to provide a defendable price tag and must also be consistent across the many components of the project so that value can be assigned to construction work packages given to partners who provide deliverables and not cash.	requirements adds to the total cost of the project and has the drawback of potentially inhibiting future development (depending on the length of the mortgage) not only for the SKA itself but for other opportunities that may arise.
CNRS, France	A project such as SKA has to be approved at the ministerial level. This requires that SKA appears as the highest ranked project in astronomy before being submitted to the ministry.	Expectation of a significant industrial return	No	(1) The E-ELT, which is better ranked, must be settled first (2) The global funding scheme, including phase 1 and phase 2, must be approved by all partners, and all funding sources must have been identified. (3) Once these conditions are met, a formal government decision can be expected on a timescale of 1-2 years at best	We have never proved very successful in raising external funding, probably because it is not very attractive from a tax point of view – besides of cultural reasons.	Direct management by the company or organization will be preferred. In kind contributions should, as much as possible, be avoided. They have most often been the source of problems. Accessing contingency depending on the governance model should be managed by the company/organization board/council, together with a finance committee	Alma is not a good case, and should be studied carefully. An ESO type organization would be preferred.	A loan would be possible on a relatively short duration, to solve cash flow issues. Long term loans would compromise the future for a long period and would not be acceptable