



The Future of Radio Astronomy in Europe: the development of a roadmap

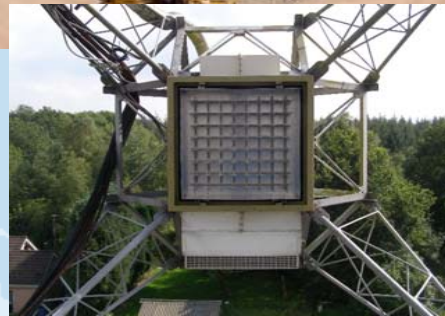
European Radio Astronomy



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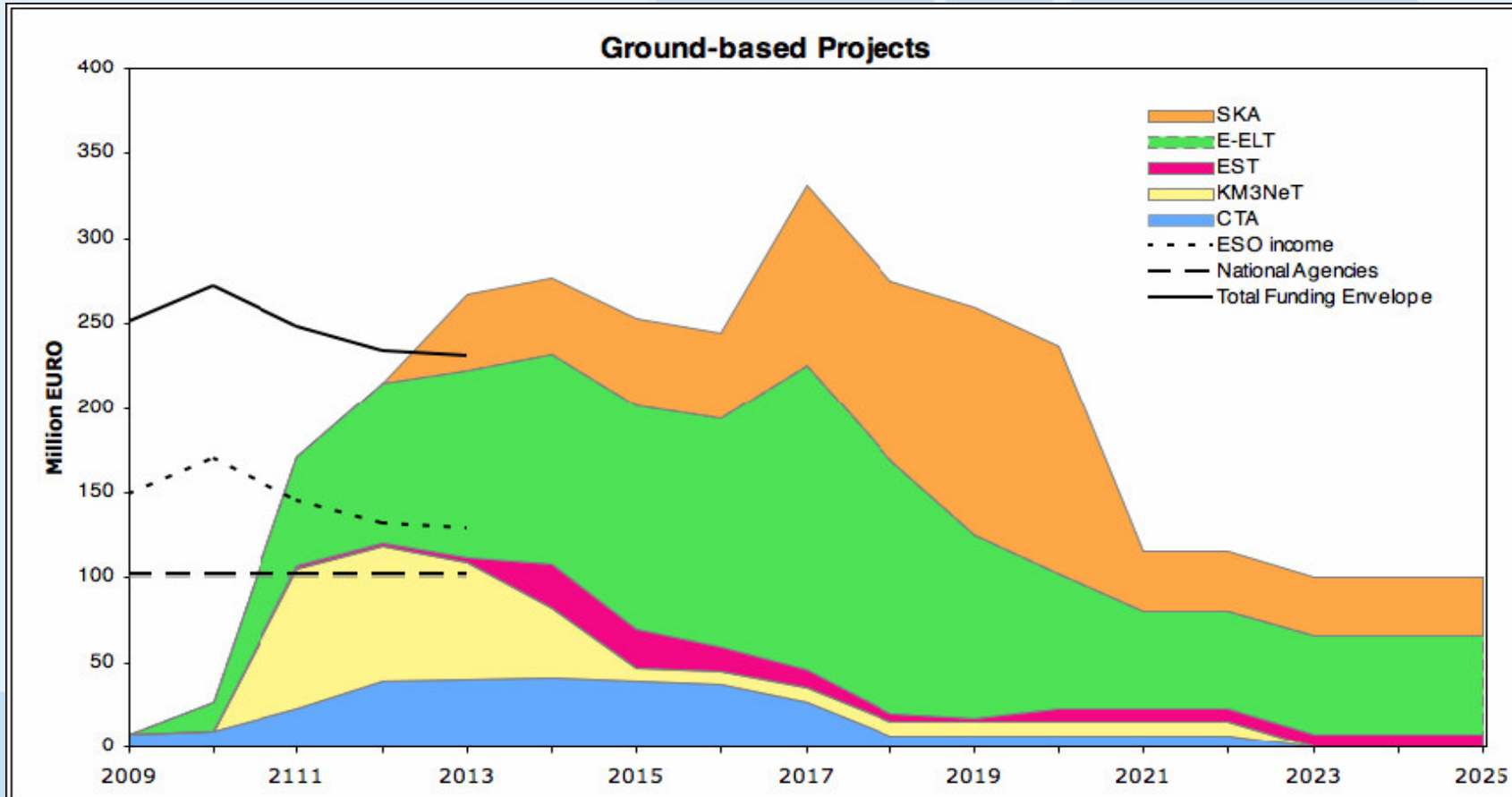


Total investment (excl ALMA): ~ €500M
 (incl ALMA): > €750M
 Annual operating cost (excl ALMA): ~€38M
 (incl ALMA): ~€63M



Motivation for a Roadmap

- ESFRI (EU govts) created its roadmap for all of science: astronomy has 3 projects there – SKA, ELT & KM3Net; already generated new money
- Astronet (an EC ERANet – mainly funding agencies) constructing European astronomy roadmap for next 10-15 years.
 - Built on Science Vision document, published April 2007
 - Roadmap discussed at symposium in Liverpool in June 2008, to be published in October 2008
 - Astronet Roadmap focuses mainly on large-scale facilities; it comments on more modest ones.
 - Identified that if Europe was to build or participate in ELT, SKA, EST, CTA and KM3Net we would require ~€200M/yr extra.
 - Identified need for the development of additional roadmaps for 2-4m OIR, 8-10m OIR and radio facilities
 - Astronet have asked RadioNet if it would produce a document which could then be developed further with Astronet during the Astronet implementation phase in 2009/10.



Funding gap of ~€200M/yr between 2012 and 2018.

But, new construction funds often come from separate, competitive bids to government. However, operational funds will come from existing resources.

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- So, question to be answered is what will European radio astronomy look like as we construct and begin to operate the SKA

Considerations in constructing a roadmap



1. What are the Science goals?
 - a) Astronet Science Vision
 - b) ALMA & SKA science cases
 - c) EVN2015, LOFAR, e-MERLIN + other national documents
2. What facilities are required to meet those goals?
 - a) Major new facilities are increasingly European or multi-national efforts
 - b) What is construction, upgrade or operational cost?
 - c) Are there national imperatives?
 - d) Are they world-class?
3. How do we train the next generation?
 - a) Need to ensure appropriate science exploitation
 - b) Need to have engineers to keep facilities state-of-the-art and to develop next generation
 - c) Need to have more modest facilities for training, experimentation, niche science
4. How can our governments afford to meet our aspirations?
5. How do we manage/govern facilities in the changing scene?

Way forward



- Meeting of facility Directors on 3rd September to discuss possible process and implications.
- Some immediate conclusions:
 - Roadmap must be science-driven, must address questions of what facilities are needed to answer major science questions before us
 - Must maintain a comprehensive set of capabilities to ensure that we do not neglect any potential areas of science
 - Must ensure that we maintain our local engineering skills, appropriate local facilities and, above all, our science exploitation personnel
 - What is the scope of such a roadmap?
 - OIR panel looking explicitly at duplication; less of an issue in radio astronomy
 - Astronet Board, in discussion RadioNet Board will define Terms of Reference
- Must involve radio user community in this process:
 - EVN-users' mtg; specific RadioNet-sponsored workshop, a questionnaire etc.