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# A GLOBAL APPROACH TO BUILD THE WORLDWIDE SKA

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## The Industrial Partnership

1° CONGRESSO NAZIONALE DELLA SCIENZA E DELLA TECNOLOGIA DI SKA  
MIUR – Rome, 19 June 2012

### □ World-class facilities for world-class science

*“Big Science is a term used by scientists and historians of science to describe a series of changes in science which occurred in industrial nations during and after World War II, as scientific progress increasingly came to rely on large-scale projects usually funded by national governments or groups of governments”.*

(Merriam-Webster dictionary)

- A Big Science Project implies:
  - Big Budgets
  - Big Staffs
  - Big Laboratories
  - Big Infrastructures and/or Machines



UNPRECEDENTED SCALE FOR BASIC RESEARCH OF THE INVOLVED SCIENCE DOMAINS

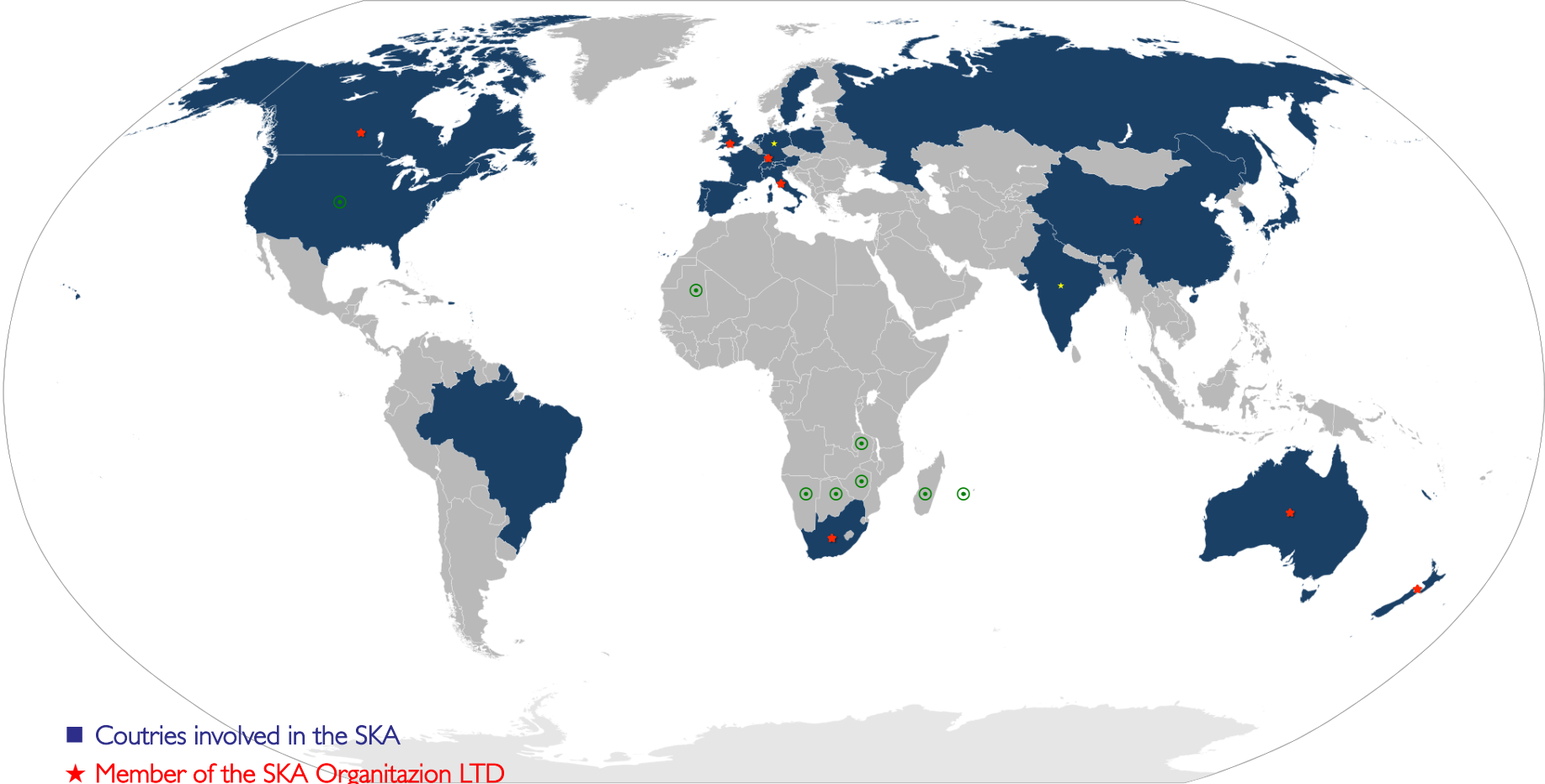
### □ The world-class SKA

- The Square Kilometre Array Project:
  - Target cost: 1,5 Billion Euros
  - Staffing: hundreds of people
  - Technology: cutting-edge developments
  - Infrastructure architecture: large and intercontinental spread



**A GLOBAL APPROACH IS REQUIRED**

□ The world-class SKA



- Countries involved in the SKA
- ★ Member of the SKA Organization LTD
- ★ Associate Members of the SKA Organization LTD (Full membership in progress)
- ⊙ Involvement expected

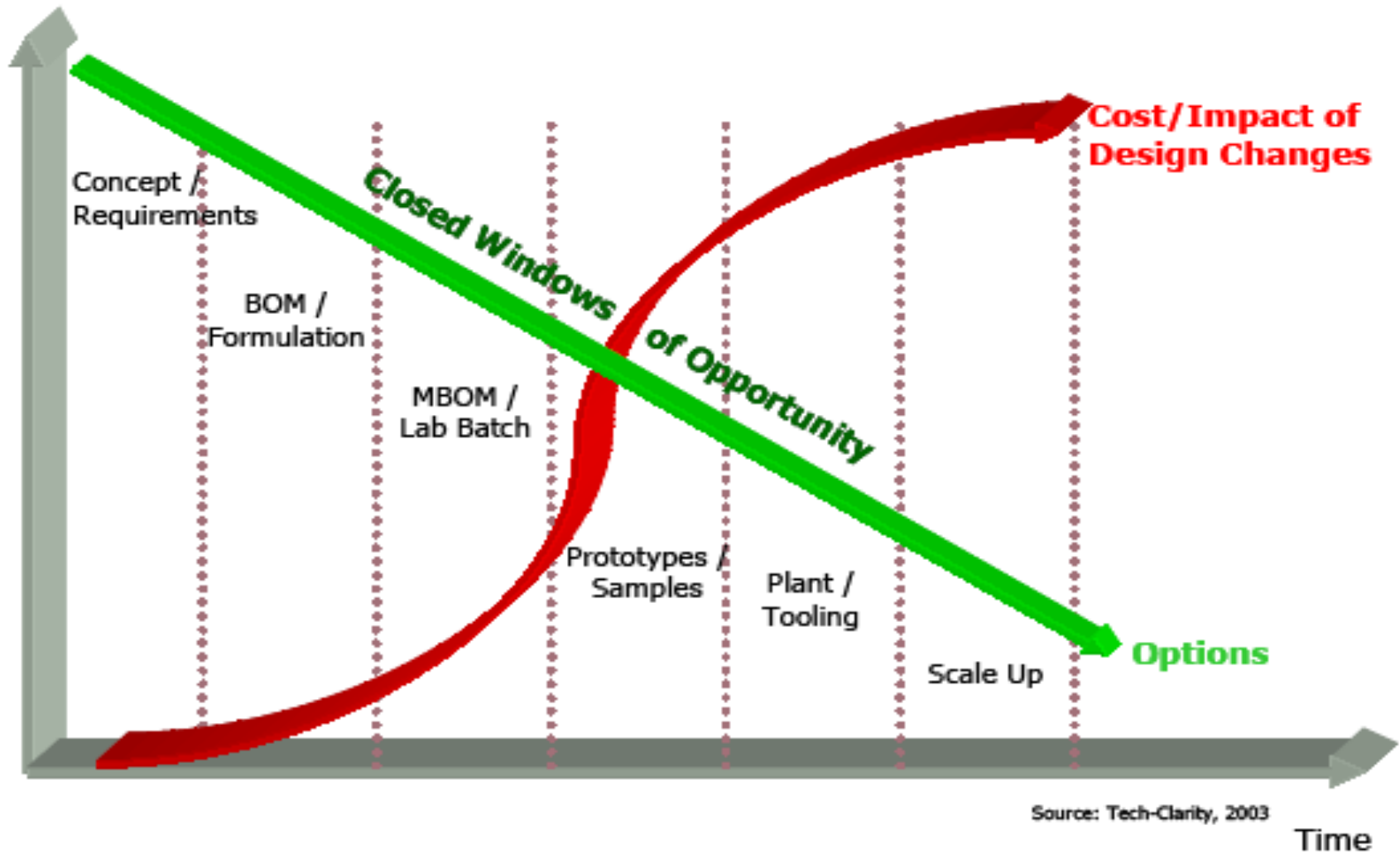


### □ Why SKA needs industry

#### ➤ The Square Kilometre Array Project:

- Cutting-edge technology based
  - ✓ exabyte computing power
  - ✓ innovative architectures of signal processing
  - ✓ green energy power supply
  - ✓ low cost maintenance
- Mass production
- Implementation of services to run on an intercontinental spread infrastructure along 50 years of life cycle

□ Why SKA needs industry



- The big challenges of a global industrial partnership:
  - Intellectual Propriety Rights Management
  - Ethical Issues

### □ The Intellectual Propriety Right Management

- Ideally, obtaining unfettered rights to project IP for application in radio astronomy.
- Obtaining formal licences covering the IP and its application within the SKA project.
- Owning some elements of the IP and obtaining a licence for the remainder.
- Owning all the IP in appropriate circumstances.
- Permitting modification and development of products and to sub-contract the manufacture the products subject to limitations agreed in the contract and listed in the IP Plan.
- Security of IP access and control for the period of the project.

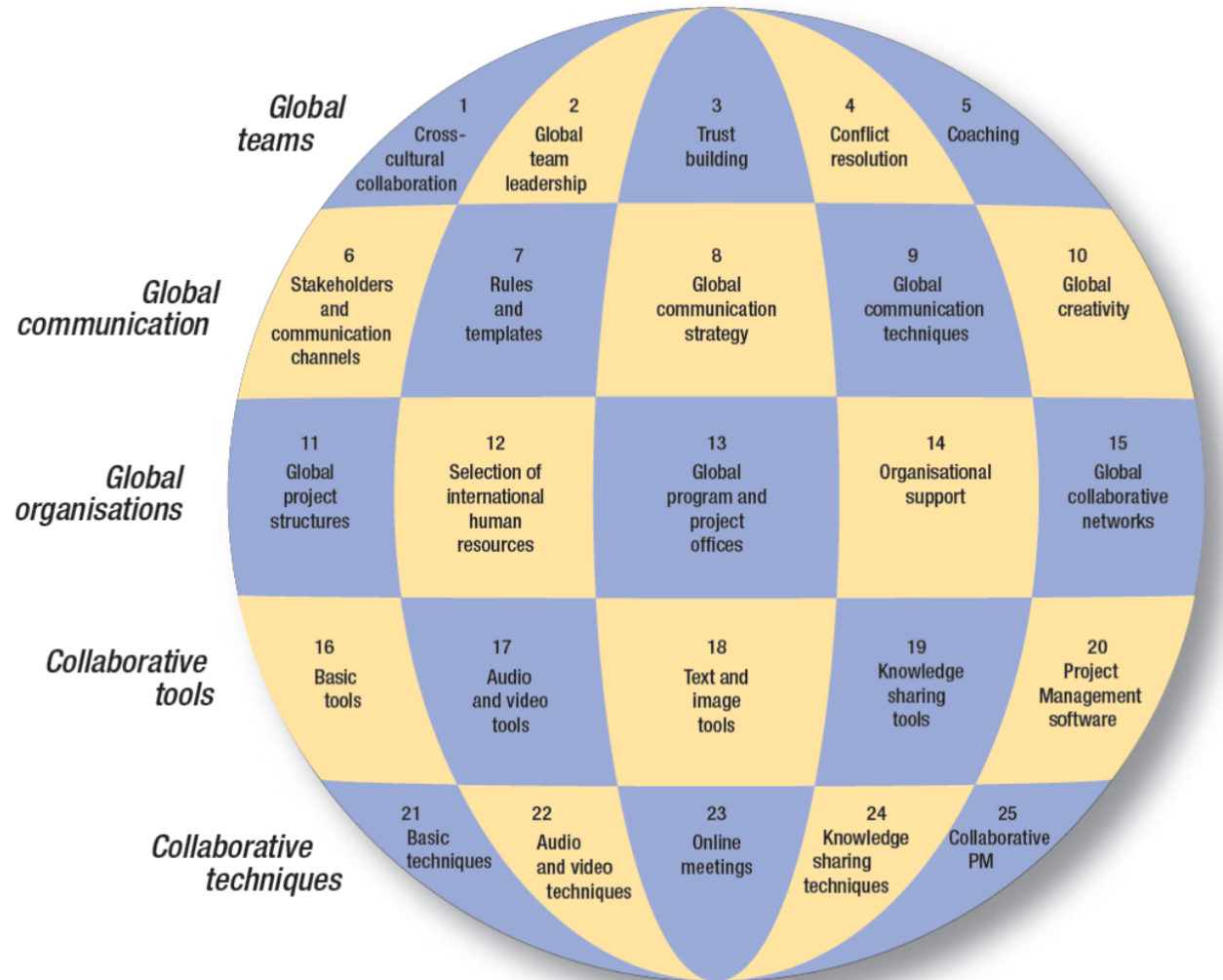




### □ The ethical issues

- Researches and engineers, that deal directly with suppliers, should:
  - ✓ recognise and deal with conflicts of interest;
  - ✓ deal with suppliers even-handedly;
  - ✓ consider seeking appropriate probity advice;
  - ✓ do not compromise the standing by accepting gifts or hospitality;
  - ✓ are scrupulous in their use of public property; and
  - ✓ comply with the duties and obligations related to privacy, intellectual property and legislative regulations.

## □ Tools to approach a global project



The Global Project Management Framework ©



- A tool to approach the global challenges of SKA

**GO-SKA**

- In 2007, the EC granted to NWO, INAF, STFC, MPG a e year FP7 project to investigate the final global framework of the SKA:
  - ✓ globally funded collaboration
  - ✓ global governance: development and implementation
  - ✓ global approach to industry engagement: development and implementation
  - ✓ SKA as a tool to address global challenges



## CONCLUSIONS (I)

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During last decade, Europe played a leading role in the world-wide SKA by addressing:

- ✓ Technological background (i.e. low frequency by international FAs funded consortia)
- ✓ Design (FP6/SKADS)
- ✓ Transient Governance (FP/PrepSKA)

The next 3 years will be crucial to define the final picture of the SKA:

EUROPE WILL PLAY, AGAIN, THE LEADING ROLE.



## CONCLUSIONS (2)

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*“When history looks at the XX century, she will see science and technology as its theme; she will find in the monuments of Big Science - the huge rockets, the high-energy accelerators, the high-flux research reactors - symbols of our time just as surely as she finds in Notre Dame a symbol of the Middle Ages. ... We build our monuments in the name of scientific truth, they built theirs in the name of religious truth; we use our Big Science to add to our country's prestige, they used their churches for their cities' prestige; we build to placate what ex-President Eisenhower suggested could become a dominant scientific caste, they built to please the priests of Isis and Osiris.”*

*Weinberg, Alvin M. (21 July 1961). "Impact of Large-Scale Science on the United States". Science 134 (3473): 161–164.*

*“The medieval stonemasons gave the same dedication and thankless fatigue in making all decorations of the cathedrals that they were building, whatever it was a facade or, rather, a most hidden interstitium that pigeons only would have been able to appreciate”*

*Beniamino Andreatta, italian economist, politician and Minister of Treasury*



## CONCLUSIONS (3)

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A must to be addressed to the italian scientists community interested in the SKA:

BEING LEADING ACTORS OF THE NEW DISCOVERIES  
THAT THE SKA WILL HELP TO ACHIEVE



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# END!

