INTERNATIONAL OPPORTUNITIES IN BIG SCIENCE PROJECTS

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INNOVATE UK 2014
THE GLOBAL SPOTLIGHT ON UK INNOVATION

SCIENCE AND TECHNOLOGY FACILITIES COUNCIL

Science & Technology Facilities Council

STFC was formed in 2007 and is one of seven national research councils in the UK. STFC:

- Funds the best research in astronomy, nuclear and particle physics
- Enables the research community to have access to the best facilities in the world
- Increases the UK technology capability, engagement with industry and knowledge transfer

SCIENCE AND TECHNOLOGY FACILITIES COUNCIL

The STFC coordinates and manages the UK's involvement and subscription with a number of international facilities.

CERN

ESO

FAIR
Facility for Antiproton and Ion Research in Europe GmbH

SKA
SQUARE KILOMETRE ARRAY

NEUTRONS FOR SCIENCE

ESRF

ess
EUROPEAN SPALLATION SOURCE

SCIENCE AND TECHNOLOGY FACILITIES COUNCIL

The STFC coordinates and manages the UK's involvement and subscription with a number of international facilities

UK membership of international facilities like CERN, ESO and SKA allows:

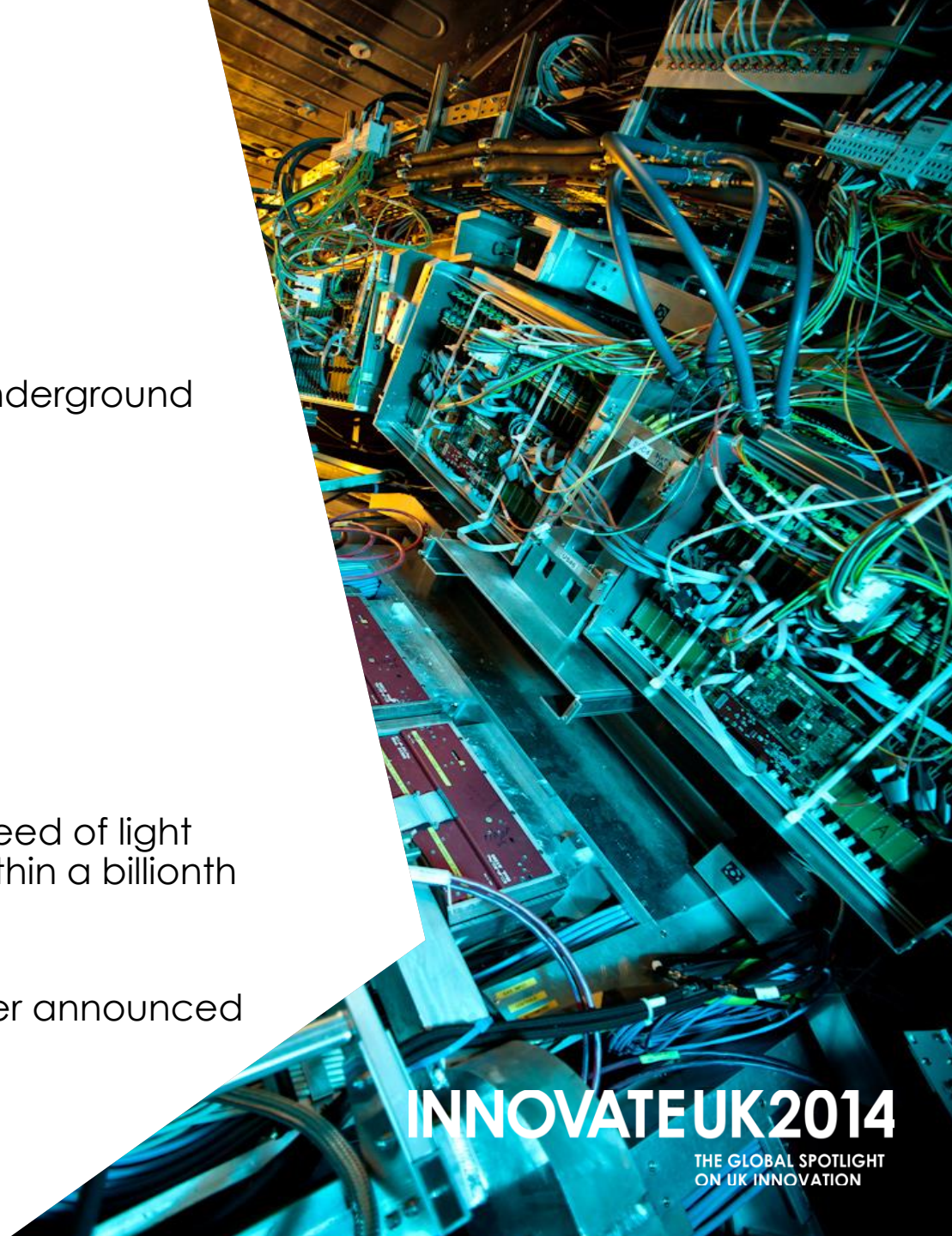
- Our physicists and engineers access to the experiments
- UK industry to bid for contracts
- UK nationals to compete for jobs and research positions at the facilities
- UK schools and teachers to visit

CERN

- World's largest particle physics laboratory
- Situated on the border of Switzerland and France
- Hosts the Large Hadron Collider (LHC) in a 27 km tunnel 100m underground
- Founded in 1954 (60 years old this year)
- 21 Member States and 6 observer states
- Annual budget: ~1 billion CHF (~ £650M)
- Procurement budget of over £300M annually
- Employs ~2500 staff and hosts ~9000 visiting scientists

Collides beams of high-energy protons or ions at close to the speed of light and allows scientists to reproduce the conditions that existed within a billionth of a second after the Big Bang

The ATLAS and CMS experiments at CERN's Large Hadron Collider announced they had each observed a new particle consistent with the Higgs boson in July 2012

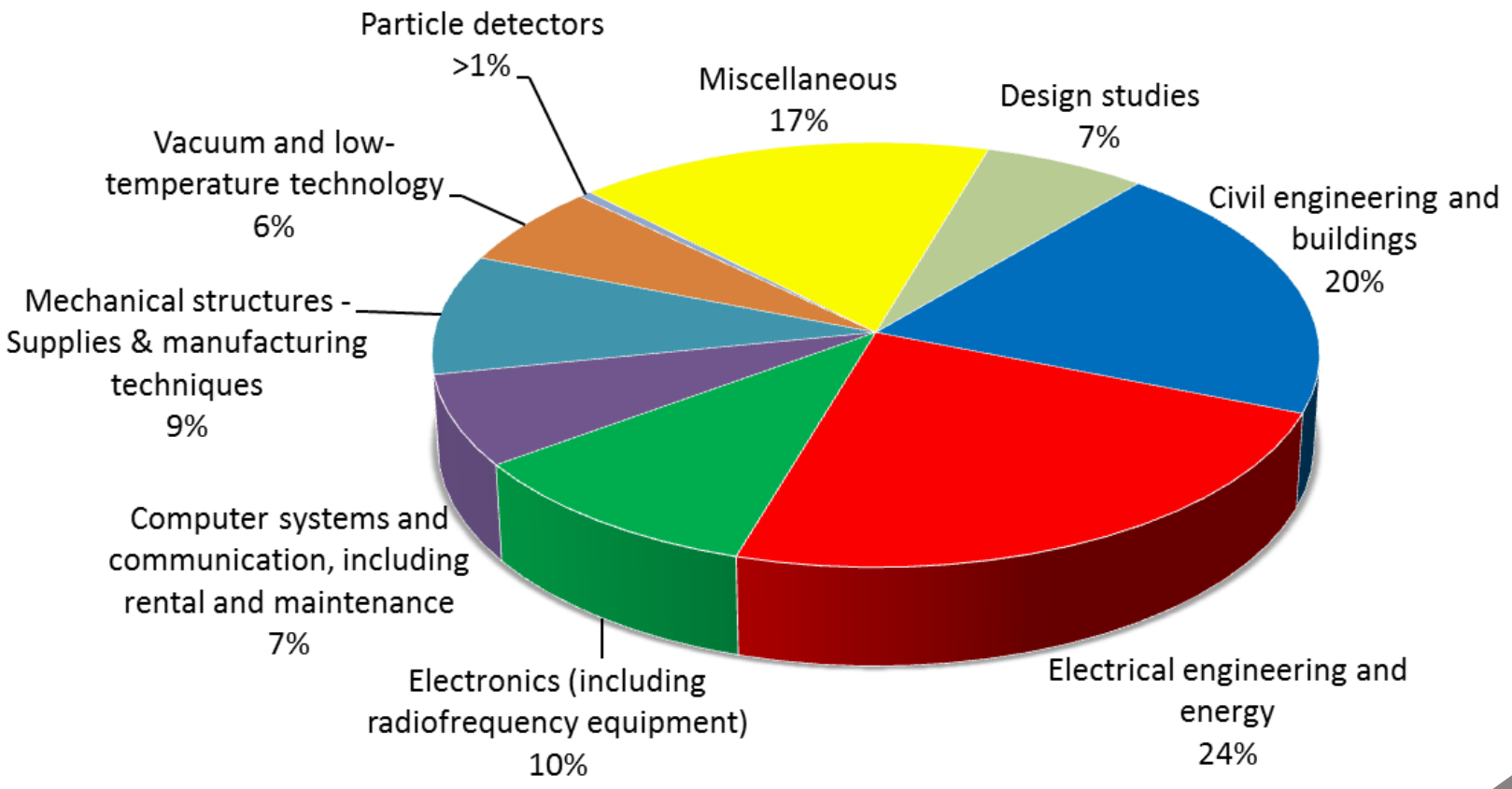


CERN PROCUREMENT

- CERN is an intergovernmental organization and has unique rules for procurement. They seek bids from suppliers in funding countries
- Each country that funds CERN has an industry liaison and they are asked to identify companies to respond to tenders which are expected to exceed 50K CHF (approx £32K)
- Contracts are often adjudicated on lowest compliant bid
- I am asked to find and recommend UK manufacturers or service providers to respond to tenders
- Being known by the technical contact is the best way to access lower value tenders
- UK companies have won over £51M in contracts from CERN in the last 3 years

CERN REQUIREMENTS

Expenditure in CERN member states in 2013 for supplies



ESRF AND ILL

- Use neutrons (ILL) and X-rays (ESRF) to do materials research
- The ILL produces neutrons using a nuclear reactor. The ESRF uses a synchrotron (a circular particle accelerator) to produce X-rays
- Based in Grenoble, France (2 hours drive from CERN)
- Both are funded by a number of European countries including the UK
- The ESRF and ILL can set their own procurement rules. They seek suppliers and service providers which manufacture in the countries which fund them
- STFC acts as the industry liaison
- Both facilities will be undergoing upgrades over the next few years

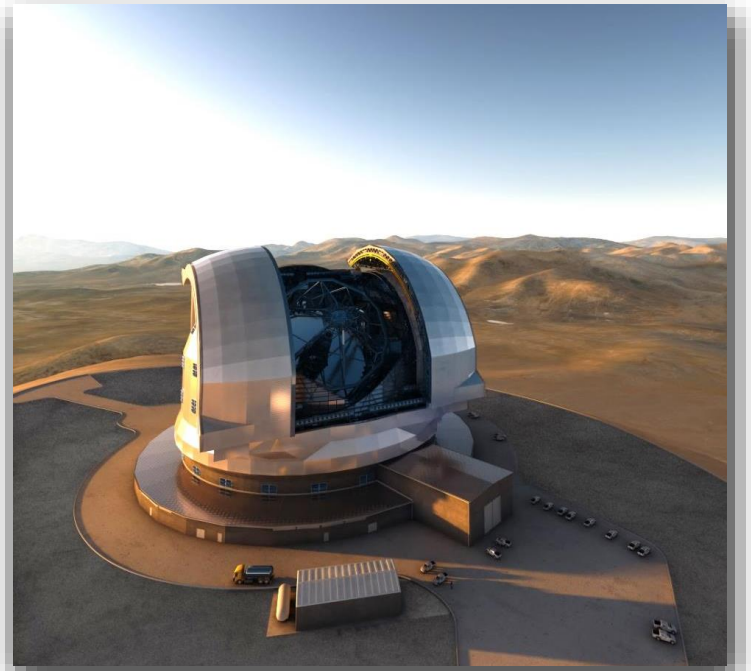
ESO

- The European Southern Observatory builds and operates a suite of the world's most advanced ground-based astronomical telescopes
- 15 member states, including Brazil
- Headquartered in Germany but operating telescopes at 3 sites in Chile; La Silla, Paranal and Chajnantor
- Annual procurement budget of just under €100million

- Advance Information webpage (for opportunities >€150k)
- http://www.eso.org/public/industry/cp/docs/CFT-advance.html
- Preliminary Inquiry/Request For Information
- PI/RFI is effectively a pre-qualification
- Companies are invited from ESO's database and from ILO proposal lists
- Call for Tender
- Contract awarded to lowest priced compliant bid

ESO

- Will be constructing the European Extremely Large Telescope (E-ELT) in Chile
- 10 year, €1billion project
- Preparations of large procurements ongoing
- 39m diameter primary segmented mirror
- 798 hexagonal mirror segments
- Telescope main structure ~2500T of steel moving ~700T of opto-mechanics & electronics
- Groundbreaking ceremony to remove the top of the 3000m peak of Cerro Armazones took place in June 2014



ESO

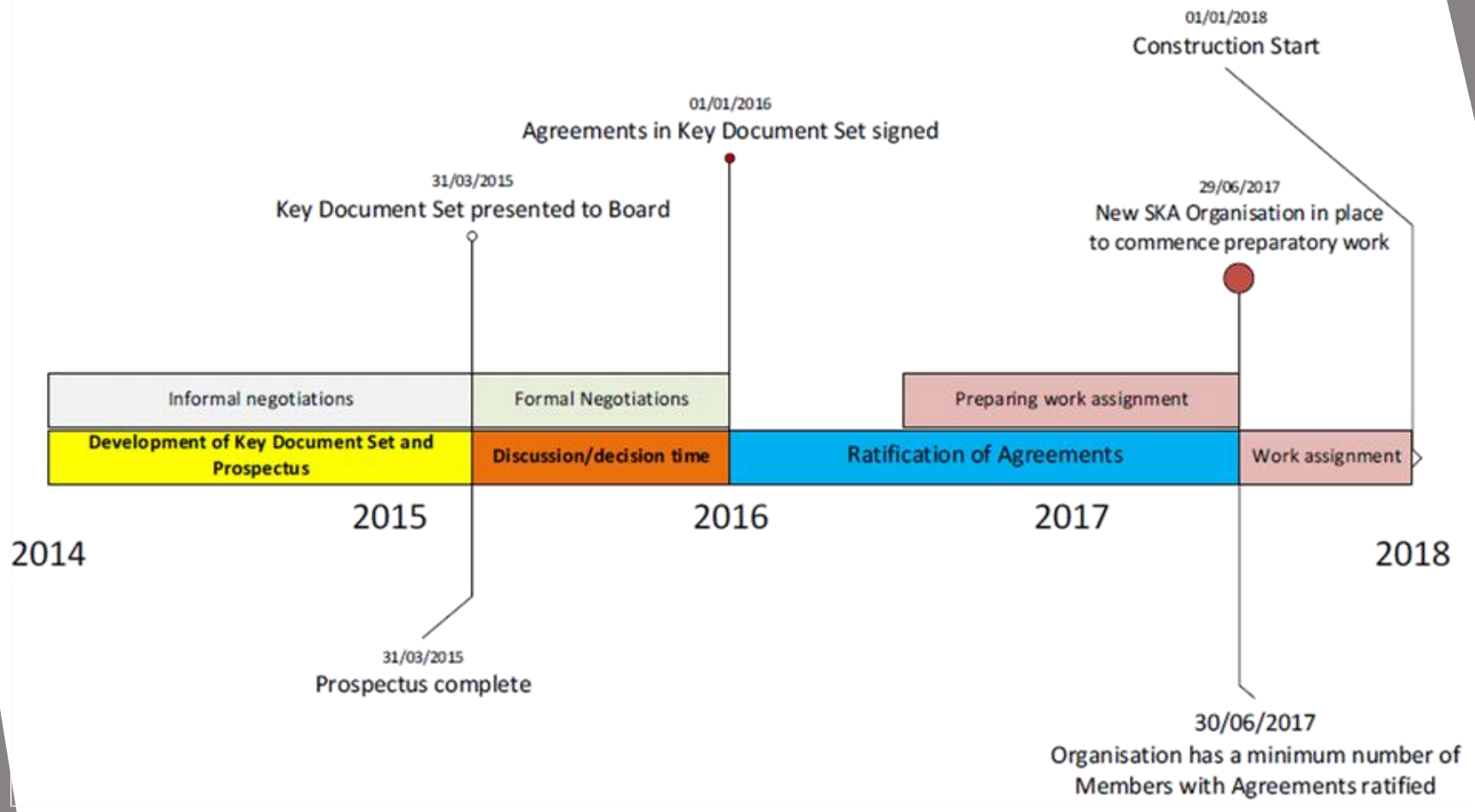
http://www.eso.org/public/product/books/elt_constrproposal/

- Excellent download resource
- Comprehensive information on the baseline design concept
- Searchable for relevant components or techniques

SQUARE KILOMETRE ARRAY (SKA)

- The SKA will be the worlds most sensitive Radio Telescope and the largest scientific instrument on the planet
- **True Big Data Project: 2023 operation 300PB/yr (onsite Exoscale)**
- 10 member states, including China, Headquartered in the UK
- Phase 1 cost cap €650M
- Currently in design stage (up to 2017)
- Current small UK procurement opportunities through University design groups at Manchester, Cambridge and Oxford
- Areas of interest Software development, Networks, high performance computing and related hardware developments, engineering and System Engineering
- For a more comprehensive list contact Allanah Bayliss (Allanah.Bayliss@stfc.ac.uk)
- Construction will take place around 2018
- STFC provide information on the current project status of the SKA, tender opportunities and up to date information on procurement

SKA TIMELINE



ESS AND FAIR

EUROPEAN SPALLATION SOURCE

FAIR
Facility for Antiproton and Ion Research in Europe GmbH

FAIR will be a new, unique international accelerator facility for research with antiprotons and ions. It will be based in Germany near an existing facility, GSI

ESS will be an international neutron spallation source for materials research. It will be built in Sweden. The UK will contribute £165M to the ESS

BARRIERS

- **For several facilities, tenders are not released publicly**
  Make links with the technical staff at the facilities and make contacts with the STFC tender opportunities team and UK contacts

- **Companies assume just 'high tech' equipment needed**
  There are a range of products and services needed at large facilities

- **International market – companies may feel they need to be familiar with the country**
  We can help explain any local requirements and UKTI can offer support to companies wishing to export

- **There may be a language barrier**
  English is an official language for many of the research infrastructures

- **Competing with companies across Europe**
  Price is key to win contracts

BENEFITS

- Contract opportunities in large research facilities is a potentially large market for the UK – a report in 2008 found that European research Infrastructures have an annual budget approaching 9 billion euros[1]

- A review of CERN's suppliers[2] found that companies:
  - Developed new products
  - Acquired new customers (other than CERN)
  - Started new R&D teams as a direct outcome of the CERN project
  - Opened a new market
  - Increased their international exposure
  - Indicated technological and market learning
  - Had improved employment growth

1. ERID watch, final report: **http://cordis.europa.eu/documents/documentlibrary/125670151EN6.pdf**
2. CERN–2003–005: Technology transfer and technological learning through CERN's procurement activity **http://cds.cern.ch/record/680242**

CONCLUSIONS

STFC can help companies enter this market. We help companies meet the right contacts at the facilities, learn about the procurement rules and notify them of relevant tenders

We work with UKTI and the industry liaisons for other large research infrastructures to provide the best service to industry

Please register here:
www.stfc.ac.uk/tenderopportunities

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Dr Kate Lancaster

Opportunities from ITER

UK Atomic Energy Authority

UNIVERSITY of York

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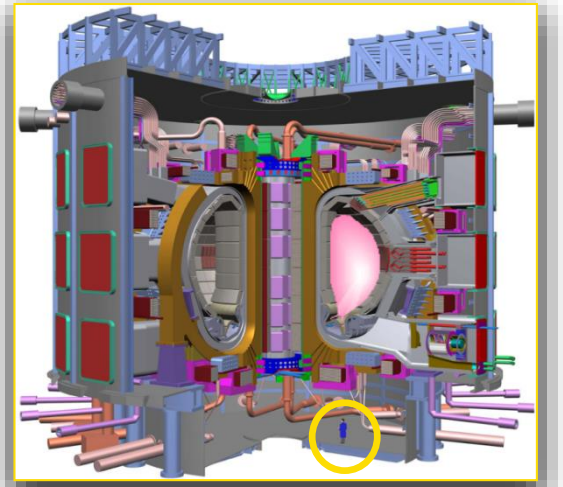
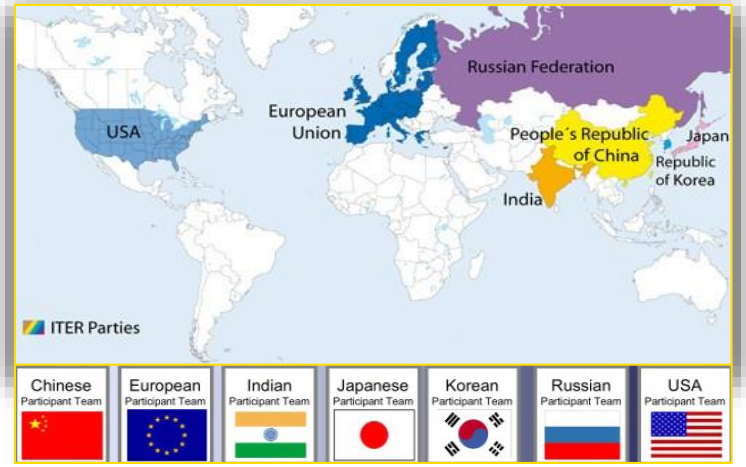
ITER – THE WAY TO FUSION ENERGY

- The ITER project is one of the world's largest scientific collaborations – big science and big engineering
- Aim is to demonstrate integrated physics and engineering of fusion on the scale of a power station
- Key ITER technologies fabricated and tested by industry
- Broad range of opportunities for industry

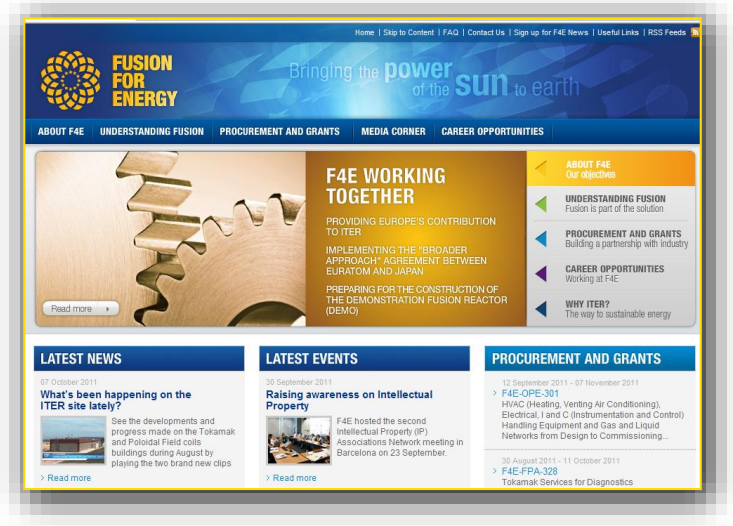




ITER -2014

FUSION FOR ENERGY

F4E primarily responsible for overseeing the procurement of Europe's "In-kind" contribution to ITER



For the latest information on:

- Current Business opportunities for F4E and ITER IO
- Grants to undertake R&D
- Events including workshops, information days, etc.

www.fusionforenergy.europa.eu

UKAEA'S FUSION AND INDUSTRY PROGRAMME

Over 200M€ worth of work already secured by UK companies including: AMEC, Jacobs, Atkins, Halcrow/CH2MHILL, Oxford Instruments, Babcock Nuclear, Doosan UK, Oxford Technologies, Tessella, Nuvia, NNL, DBD Nuclear and many more

We are encouraging UK companies to:

- Register with our database www.fusion-industry.org.uk
- Talk to us before registering on F4E database https://industryportal.f4e.europa.eu/default.aspx
- Respond to forthcoming tenders http://fusionforenergy.europa.eu/
- Contact the ILO Dan Mistry (or myself) if you require our help and expertise

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