BRINGING THE POWER OF THE SUN TO EARTH

iter

CHINA EU INDIA JAPAN KOREA RUSSIA USA

FUSION FOR ENERGY

Achieving Industry Buy In: the ITER Way

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IEA FPCC - The Promise of Fusion

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Outline

1. The ITER project
2. ITER and industry
3. Challenges for industrial involvement
4. Achieving buy-in

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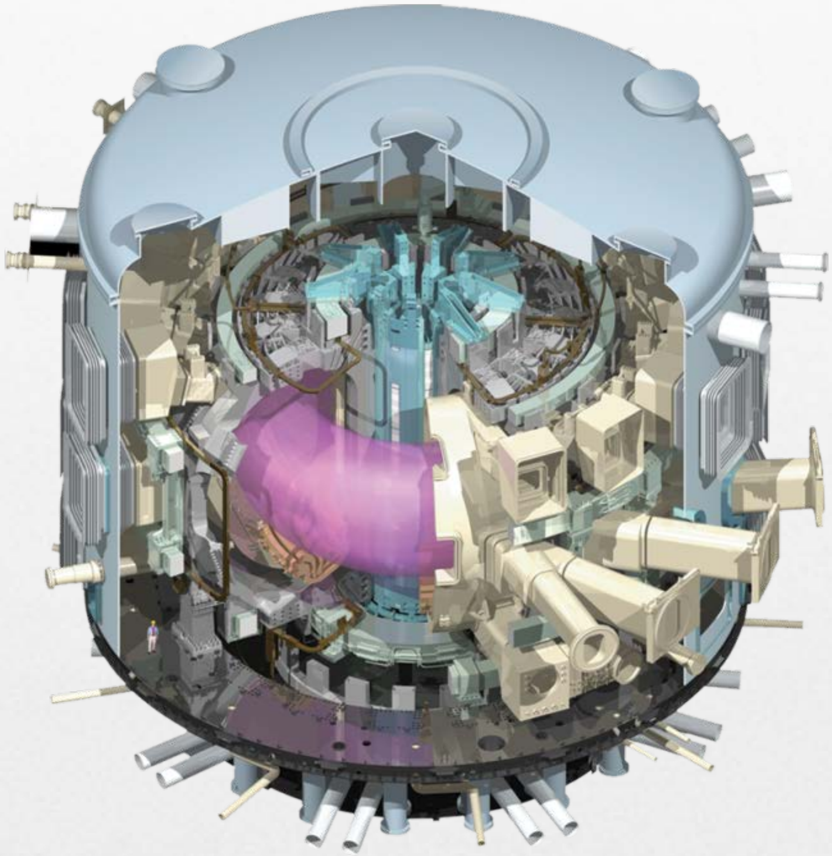
What is ITER for?

Demonstrate fusion as practicable energy source

- Fusion energy generation on large scale
- 10 times more energy generated than used to heat the plasma
- Study of “burning plasma“ and its long operation
- Testing key technologies for future fusion reactors



The ITER project

The largest international energy research project

Seven parties
More than 50% of global population
More than 80% of global GDP

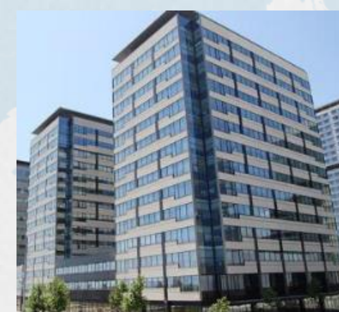
ITER in Europe

ITER Organization

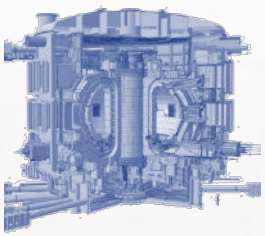
- ITER integration and operation team for ITER
- 7 parties
- Headquarter: Cadarache, France
- Staff: 500+
- Budget to 2020: ~2.6 billion EUR

Fusion for Energy

- European domestic agency for ITER, procuring and delivering 45% of ITER components
- 29 member states (EU28 + CH)
- Headquarter: Barcelona, Spain
- Staff: 450+
- Budget to 2020: ~7.4 billion EUR



An impressive machine



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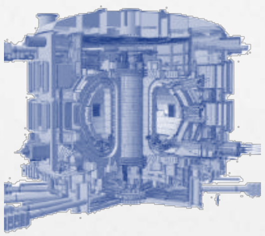
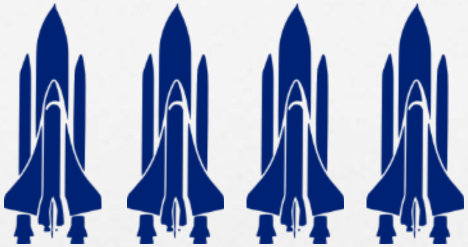
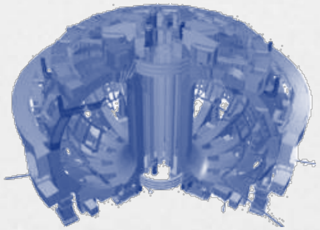


= 10,000,000 parts =





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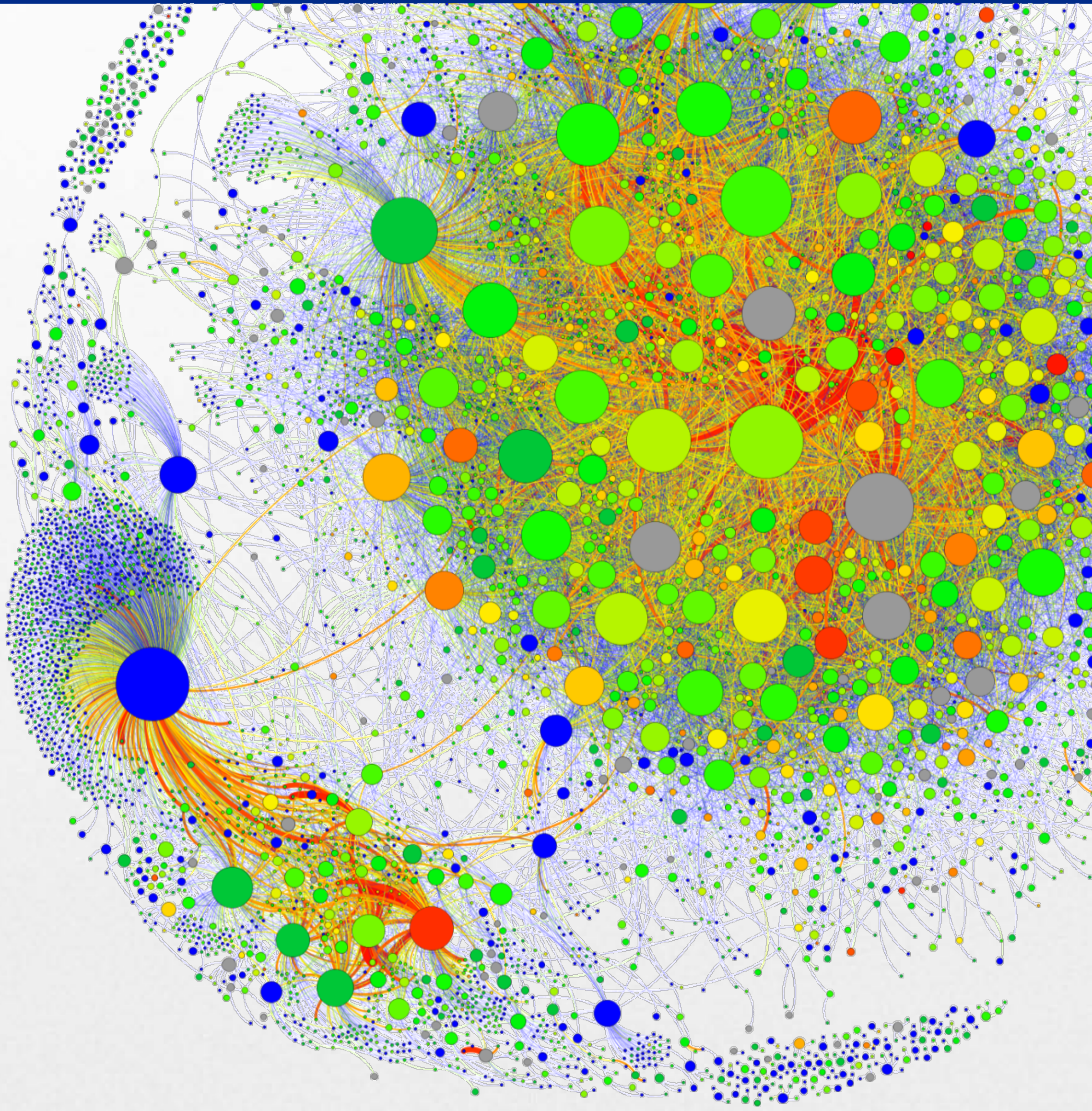
An impressive machine

- Orders of magnitude scaling-up for many technologies
- Very high integration system
- Developing new ways of working together
- Adapting to complexity and distributed teams



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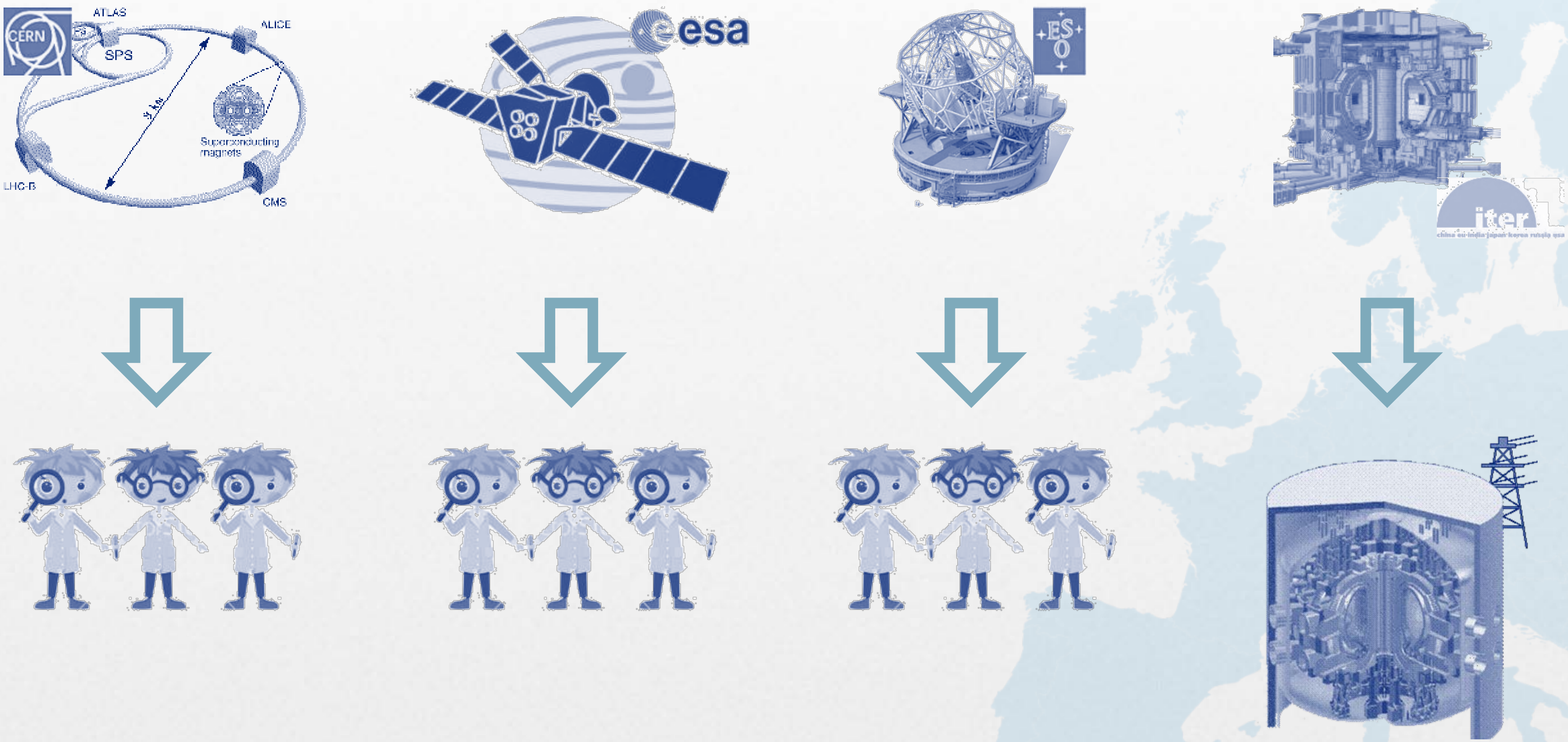
Big science projects with a difference

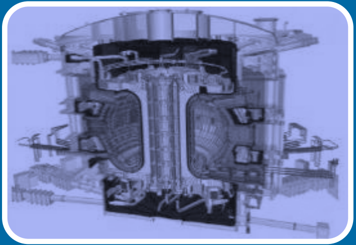


ITER is a step along a longer path

Towards commercial power-plants

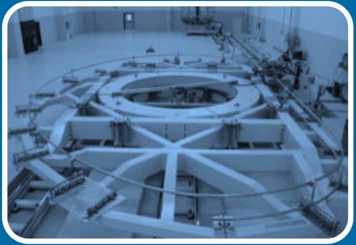
ITER is also about industry and supply chain

F4E industrial policy



First Objective

Deliver the European contributions to ITER and the Broader Approach within the agreed budget and schedule making best use of the industrial and research potential and capabilities of all F4E members, in line with competition rules



Second Objective

Broaden the European industrial base for fusion technology for the long-term development of fusion as a future energy source and to ensure a strong and competitive European industrial participation in the future fusion market

Third Objective

Foster European innovation and competitiveness in key emerging technologies to further the development of the Innovation Union and its impact at the international level.

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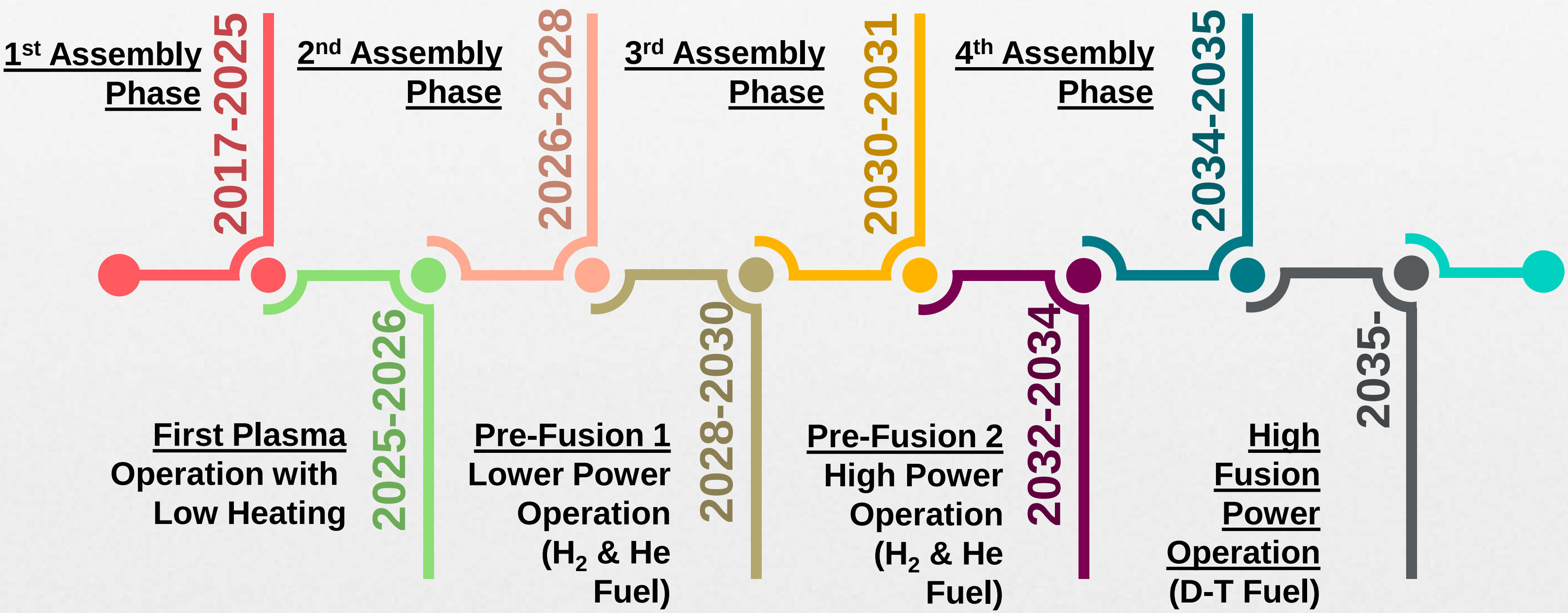
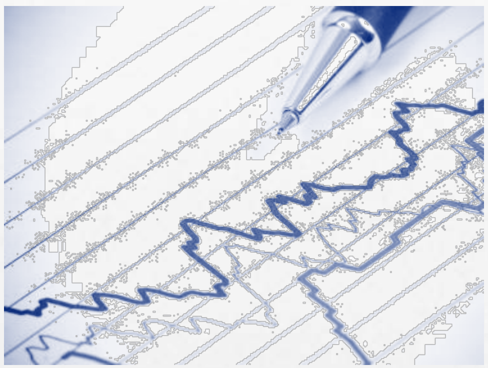
Long term construction plan

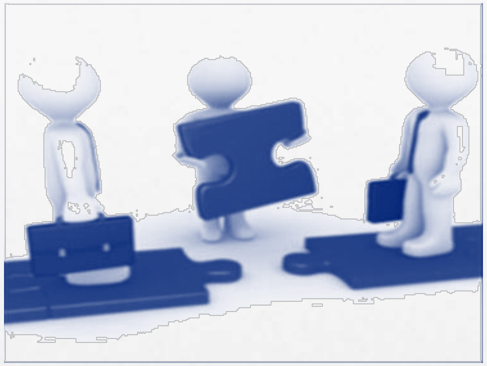
- Long term engagement needed
- Decade-long product development lifecycles



Inefficiencies in supply chain



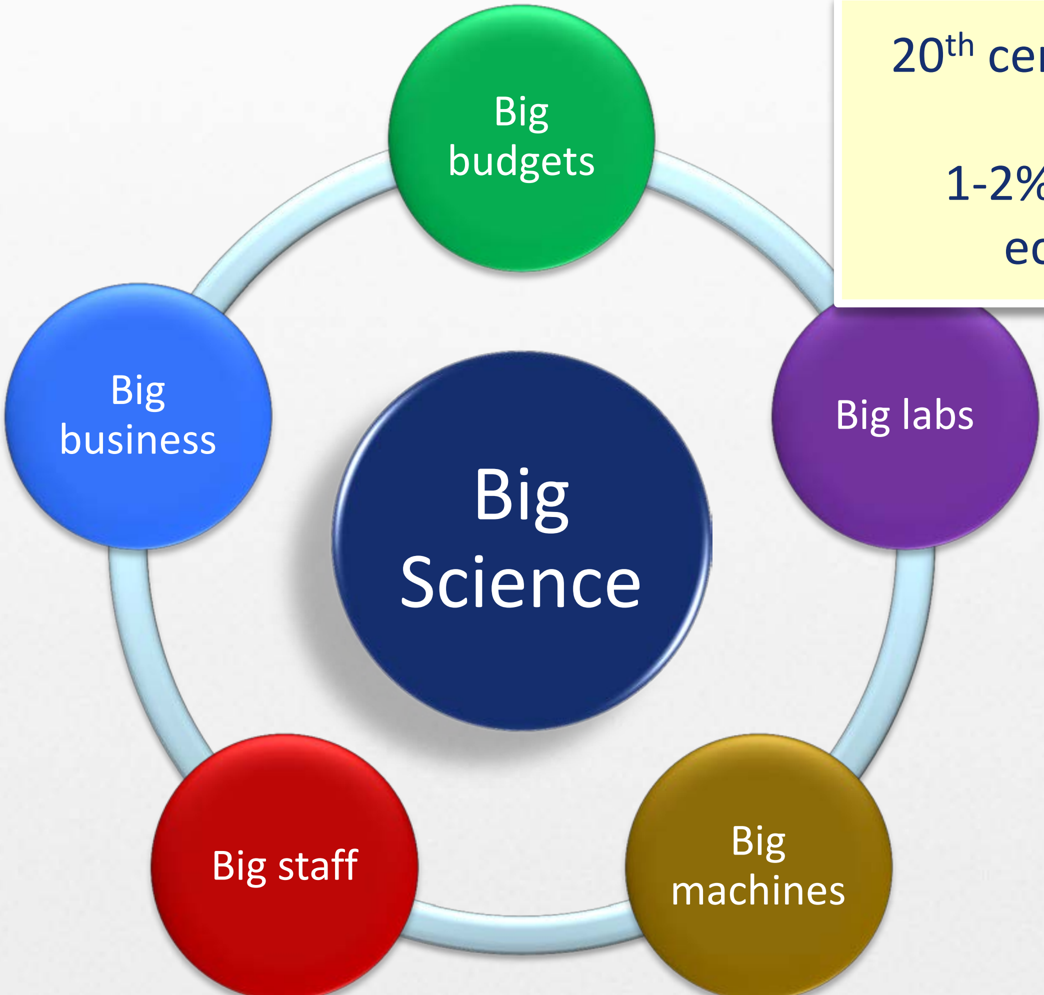
- The time variability in projects procurement volume and technology needs



- The gap between companies’ interest in projects and skills/resources to perform

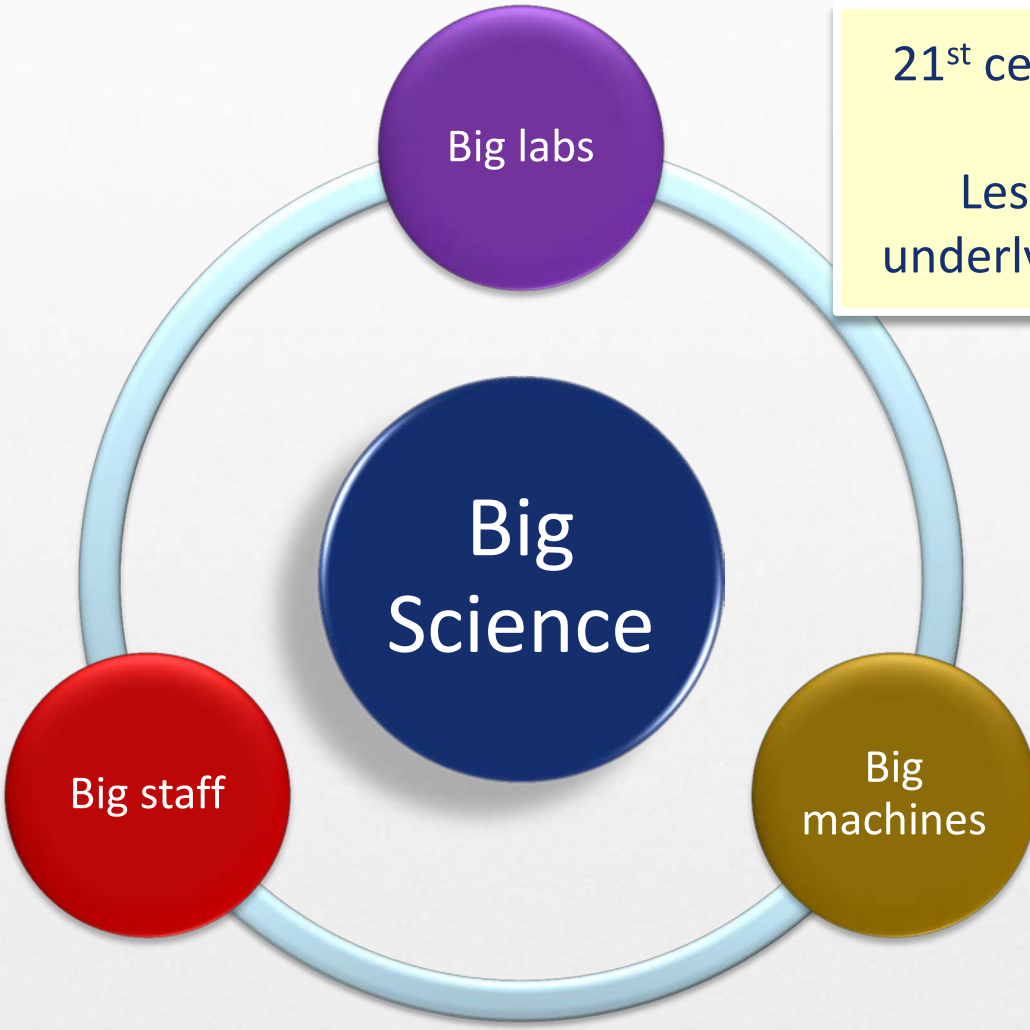
- The competition among S&T projects for production capacity and human resources

A developing Big Science context



20th century Big Science budgets = 1-2% of underlying economy size

A developing Big Science context



21st century Big Science budgets =
Less than 0.1% of underlying economy size

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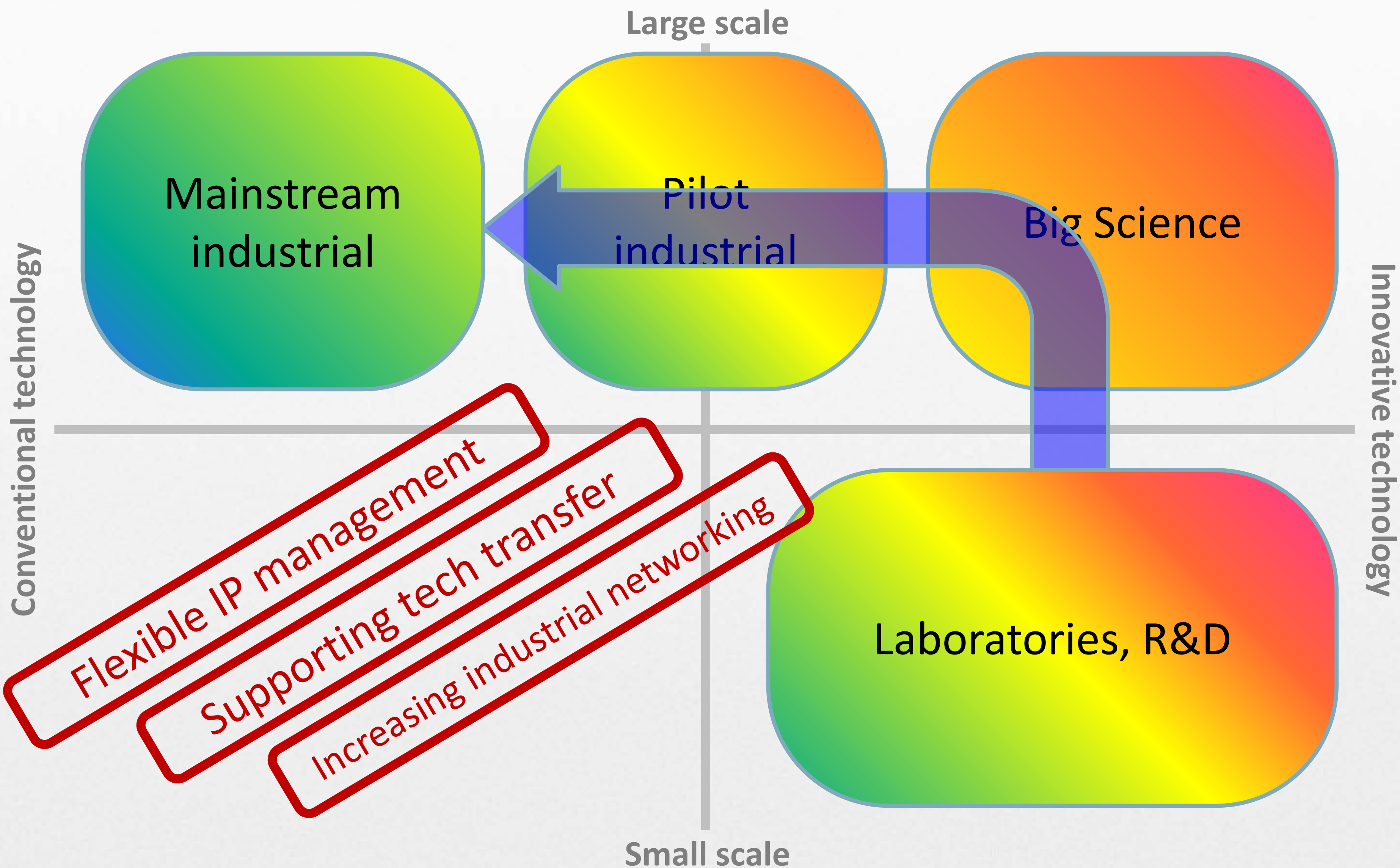
Improving the appeal for industry

Improving the appeal for industry

Facilitating technology migration



Promoting effective business models

Product-centric
Components
Big Science as any other business

Technology-centric
Sub-systems
Big Science as springboard into mainstream

Skill-centric
Pooling capabilities to deliver systems
Big Science as core business

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Pooling capabilities to deliver systems

Big Science as core business

Coordinating with other S&T projects

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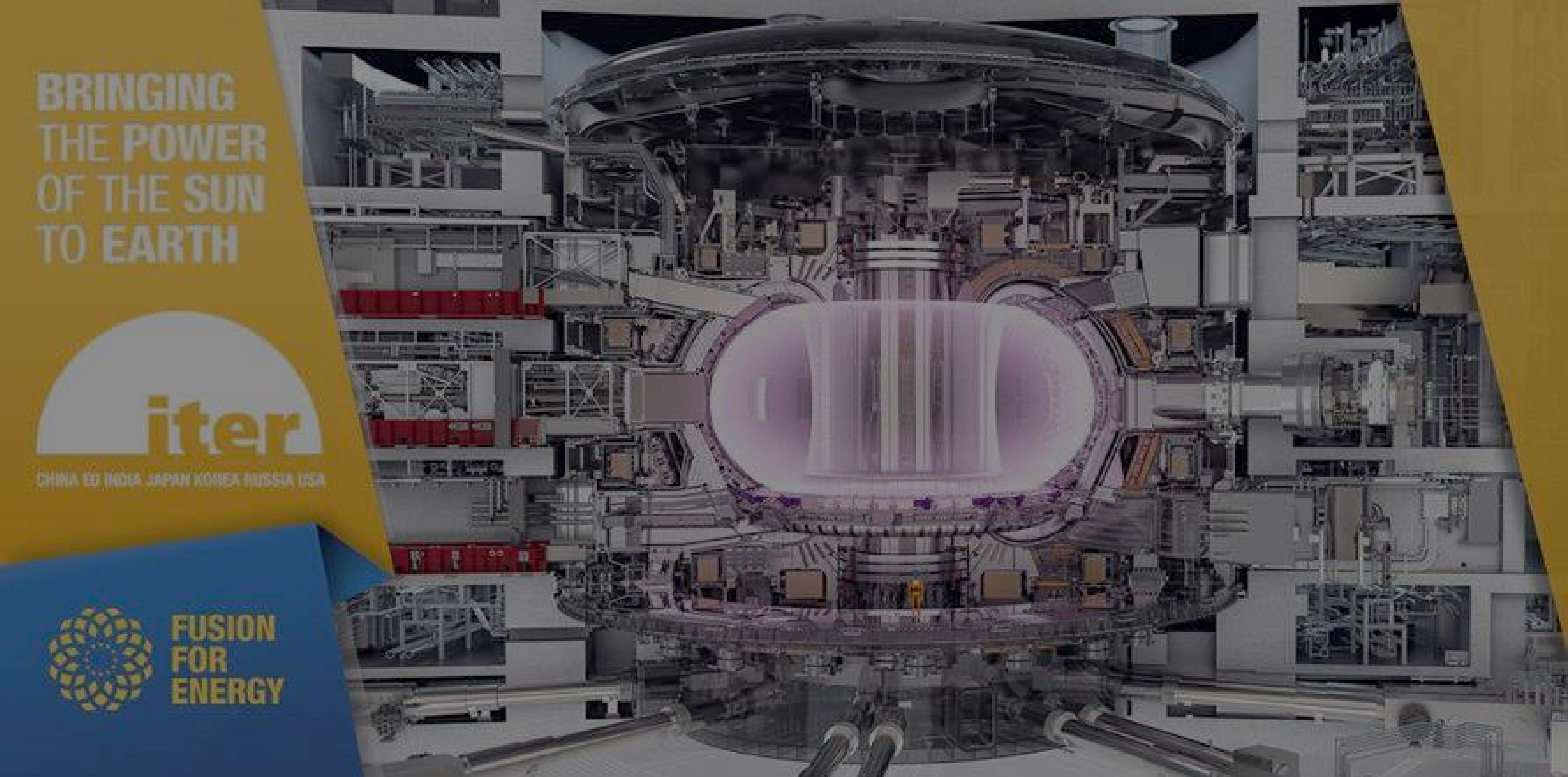

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