Achieving Industry Buy In: the ITER Way

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IEA FPCC - The Promise of Fusion
January 25th, 2017
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

= 23,000 t =

= 10,000,000 parts =

= 9,000 t =
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 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

Mainstream industrial

Large scale

Pilot industrial

Small scale

Big Science

Laboratories, R&D

Conventional technology

Innovative technology

Flexible IP management

Supporting tech transfer

Increasing industrial networking
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
Promoting effective business models

Product-centric
Components
Big Science as any other business

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Skill-centric
Pooling capabilities to deliver systems
Big Science as core business
Coordinating with other S&T projects
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