THHINK of the Future - SME Perspective on Innovation Mechanisms

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Group

THHINK

“THHINK and Do” Applications Engineering

“THHINK IT Through” ICT Consultancy

“THHINK for itself” Autonomous Systems

“THHINK Ahead” Long Term Research

Smart Anything Everywhere (Anytime)
Smart Applications

Remote Monitoring

Self-Powered Phone

Nuclear Monitoring

Micro-generator

Satellite Comms.

Autonomous Sea Vehicles

Formula 1 Monitoring

Satellite Comms.
SMEs are important for Innovation

Definition

– <= 250 employees (US 500)
– <= 50MEuros Annual Turnover
– <= 43MEuros Annual Balance Sheet

Reality

• 99% of EU Enterprises are SMEs (20.7M)
• 2/3 of jobs provided by SMEs
• 85% of new jobs created by SMEs

THHINK

96% of SMEs in UK are Micro-SMEs 0-9 people
Getting to Market

Development Stage of Commercial Product

Basic Research
- Net Cash Flow
- Research Grants

Applied Research
- Development Grants
- Founders, Friends and Family (€5-50K)

Proof of Concept
- Target Market
- Business Plan

Working Prototypes
- Angel Investors (€50-500K)
- Early Stage Venture Capital (€500-2M)

Engineering Prototypes
- Supplier Contracts
- Venture Capital (€2-50M)

Production Prototypes
- Distribution Contracts
- Private Equity, Project Financing (€2-50M)

Product Introduction
- Initial Public Offering, Merger, Acquisition €25M+

Revenue

“Valley of Death”

Funding
Funding

• Research funding

• Business angel funding for more early stage and more risky development

• Private equity funding for more mature product development
Funding Gap

Public Funds

Funding Gap

Private Funds

Industry

Venture Capital

Business Angels

Research
Development
Commercialisation

Entrepreneurs take risks!
Impact of Brexit

Before

After

Pound vs. Dollar
Skills

Expertise Needed
- Theory
- Research
- Science

Idea
- Design
- Engineer
- Prototyping

Invention
- Commercialisation
- Delivery
- Acceptance

Innovation
- Belief
- Creativity
- Experience
Why get involved with schemes?

• SMEs have limited finances/resources
  – Funding for R&D
  – Knowledge and skills
  – Need to network
  – Raise international profile

New Product: Is there a market?, can we make money out of it?, can we make it (technically feasible at the right price)?, competitive position?, risk to company if pursue?
US SBIR

SBIR/STTR Commercialization Roadmap

Phase I
- Technical Feasibility
- $100K-$150K
- 6 Mo – 1 year
- Establish:
  - Technical and scientific merit
  - Feasibility
  - Commercial potential
  - Demonstrate strong team potential
  - Demonstrate work can be completed within the time frame and budget
  - Generally, only Phase I awardees can compete for Phase II

Success rate 20-40%

Phase II
- Prototype
- $500K-$1M
- Up to 2 Years
- Continue R&D efforts initiated in Phase I
- Increasing emphasis on commercial and the ability to commercialize successfully
- Demonstrate strong leadership team
- Demonstrate work can be completed within the time frame and budget
- Occasionally, an applicant can enter the process at this phase

Phase III
- Transition to Commercialization
- Privately funded
- Scaling of the business to the market
- Privately funded through financing, licensing, and/or strategic partners
- Some Federal agencies may allow follow-on, non-SBIR funded R&D production for innovations to be used by the U.S. Government
Funding Available

SBIR/STTR Budgets by Agency, FY 2015

~$2.5B in FY15 across all agencies

**Agencies with SBIR & STTR Programs**

<table>
<thead>
<tr>
<th>Agency</th>
<th>Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department of Defense (DOD)</td>
<td>$1.070 B</td>
</tr>
<tr>
<td>Department of Health and Human Services (HHS): National Institutes of Health (NIH)*</td>
<td>$797.0 M</td>
</tr>
<tr>
<td>Department of Energy (DOE), including Advanced Research Projects Agency (ARPA-E)</td>
<td>$206.1 M</td>
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<tr>
<td>National Science Foundation (NSF)</td>
<td>$180.1 M</td>
</tr>
<tr>
<td>National Aeronautics and Space Administration (NASA)</td>
<td>$176.0 M</td>
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**Agencies with SBIR Programs**

<table>
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<th>Agency</th>
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<tbody>
<tr>
<td>U.S. Department of Agriculture (USDA)</td>
<td>$20.3 M</td>
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<tr>
<td>Department of Homeland Security (DHS): Science and Technology Directorate (S&amp;T) and Domestic Nuclear Detection Office (DNDO)</td>
<td>$17.7 M</td>
</tr>
<tr>
<td>Department of Education (ED)*</td>
<td>$8.4 M</td>
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<tr>
<td>Department of Transportation (DOT)</td>
<td>$7.9 M</td>
</tr>
<tr>
<td>Department of Commerce (DOC): National Oceanic and Atmospheric Administration (NOAA) and National Institute of Standards and Technology (NIST)*</td>
<td>$7.5 M</td>
</tr>
<tr>
<td>Environmental Protection Agency (EPA)</td>
<td>$4.2 M</td>
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*NIH and ED also issue contracts; Within DOC, NIST issues grants and NOAA issues contracts
EU-US SME Differences

US
- Typically $5-10M to start
- People have specific skills and function
- Easier to scale

EU
- Typically 1-2 MEuros to start
- Smaller number of “Swiss Army Knife People”
- More difficult to scale
EU Instruments

- Collaborative projects: 13%
- SME instrument: 7%

20% budgetary target in LEITs & SC

‘Innovation in SMEs’

Eurostars II
- Enhancing Innovation Capacity
- Market-driven Innovation

Access to Risk Finance
Instruments

- **H2020 LEIT**
  - 3 partners
  - 100% funding
  - Research and Innovation Actions
  - Innovation Actions
  - Coordination and Support Actions

- **EUROSTARS II (EUREKA/EU)**
  - 2 partners - transnational
  - UK 60% funding up to 360K Euros /NL 45% up to 500K Euros
  - Research Intensive
  - 1.2Bn Euros funding

<table>
<thead>
<tr>
<th>Applications submitted</th>
<th>Projects funded</th>
<th>Estimated public funding</th>
<th>Average success rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.553</td>
<td>472</td>
<td>290 M€</td>
<td>30%</td>
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</table>
SME Instrument (c.f. SBIR)

SME Instrument
- Can do by yourself!
- 3 Phases
  1) 50K Euros
  2) Typically 1.5MEuros
  3) 0!
- 70% funding
- Get coaching

(Note funding split difference with SBIR)

Executive Agency for SMEs - EASME
Which countries get funded?

Horizon 2020's SME Instrument
Looking for Europe's next innovation leader
3 May 2016 Cut-off Results - Phase 1 | Projects funded per country

Very Competitive

Phase 2
33 out of 960
3.4% success rate
ICT, Energy, Transport and Smart Cities are the main benefactors
Innovation and Financial Instruments

• Fast Track to Innovation Pilot
  – Up to 3-5 partners from 3 member states
  – 3MEuros
  – Need high impact

• Financial Instruments – helping to get finance (VCs don’t like early stage companies). Need to provide guarantees

• Access to risk finance, loan service, early stage finance
COSME - Competitiveness of Enterprises and Small and Medium-sized Enterprises

• COSME will support:
  – better access to finance for SMEs
  – access to markets for SMEs
  – entrepreneurship
  – more favourable conditions for business creation and growth

• 2.3 Bn Euros

• Problem oversubscription – 16,000 applicants
## Innovation Strategies

<table>
<thead>
<tr>
<th>Innovation Catalyst</th>
<th>Useful For</th>
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<tbody>
<tr>
<td>Competence Centres</td>
<td>To promote interaction between researchers, industry, and the public sector, in research topics that promote economic growth</td>
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<tr>
<td>Regional initiatives</td>
<td>To improve competitiveness of SMEs both locally and internationally, help with qualification, upgrading and diversification, test solutions, and carry out early implementations</td>
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<tr>
<td>Innovation Clusters</td>
<td>To bring together industry and researchers to address specific topics or markets with the aim of creating critical mass in technological areas</td>
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<tr>
<td>National initiatives</td>
<td>National initiatives can be used to engage with larger companies accelerating research and technology in areas that are considered to be nationally important, develop a technological lead and provide a strategic vision of the future</td>
</tr>
<tr>
<td>Flagship Projects</td>
<td>Flagship research and development projects can be used to support strategically and scientifically defined objectives and engage with many project partners across Europe</td>
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<tr>
<td>Platform Building</td>
<td>Platforms can be used to create ecosystems or support specific sectors. They need to be interoperable, modular, and scalable with open and standardised interfaces. Critically for uptake they need to be affordable both from applications development and operation perspectives, with clear and easy understandable business cases</td>
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<tr>
<td>Demonstrators and Large Scale Pilots</td>
<td>Demonstrators and Large Scale Pilots are seen as essential to show potential adopters, both SMEs and large companies, that new technologies and solutions can be exploited in the real world.</td>
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<tr>
<td>Entrepreneurship</td>
<td>Education via an entrepreneurship programme eliminates the fear of failure and provides guidance and support for patenting, commercialization of R&amp;D results and business start-up.</td>
</tr>
<tr>
<td>Education and Skills</td>
<td>To promote holistic digital skills and training support at all levels, disseminating best practice and experience to re-skill and up-skill the workforce.</td>
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Supply Side vs. Demand Side

Supply Side
Use innovation policies to support
• R&D
• New Technology
• Development

Demand Side
Use innovation policies to support and increase the uptake of innovation
• Legislation
• Safety regulations
• Standards
• Public procurement

EC can stimulate both supply and demand sides
Concluding Remarks

Need

- Funding for RD&I
- Knowledge and skills
- Need to network

- Existing SME instruments much improved and more attractive – success rates an issue (ROI of effort)
- Difficulty of engaging – SMEs tend to engage better at regional level
- Entrepreneurs very busy people – time & paperwork...

Need to link regional, national and EU initiatives to avoid duplication and maximise impact of limited funding resources