

Current science and innovation policy priorities and challenges for the future in Europe

*HC Coombs Policy Forum
Canberra, March 23, 2011*

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Outline

- » The changing global research and innovation landscape
- » Responses:
 - At European level
 - At national level: example of Sweden
 - At agency level: Swedish Governmental Agency for Innovation Systems VINNOVA
- » Conclusions

***France dumps its foreign minister, Germany its defence minister —
and all of Europe frets over its place in the world***



Source: The Economist, March 3, 2011

**This also applies both to science and innovation and
to science diplomacy!**

The world around us is changing...

1. Science and innovation are going global
2. Global knowledge and innovation resources are increasing dramatically, driven by Asia and developing countries
3. The new knowledge and innovation hubs combine rapidly growing demand for and supply of innovation and research
4. Taking knowledge and innovation to where the greatest challenges lie; Global challenges require global cooperation in science, technology and innovation
5. The rise of "knowledge power" and the emergence of a multipolar world (knowledge strength increasing more rapidly than economic strength)? Science Diplomacy?

Knowledge resources shifting towards developing countries

- » *Between 2002 and 2007, developing countries increased their global share of researchers by 8.1% (from 30.3% to 38.4%).*
- » *They accounted for 24% of the total gross domestic expenditure on R&D in 2007, which is an increase from 17% of the global share seen in 2002.*
- » *China, ..., heavily influenced these results ..., accounting for 39% of R&D expenditure and 53% of researchers in developing countries.*

UNESCO Institute for Statistics, Nov. 9, 2009

Reverse innovation

- » "For decades, GE has sold modified Western products to emerging markets. Now, to preempt the emerging giants, it's trying the reverse"
- » "Success in developing countries is a prerequisite for continued vitality in developed ones"

(Harvard Business Review, October 2009)

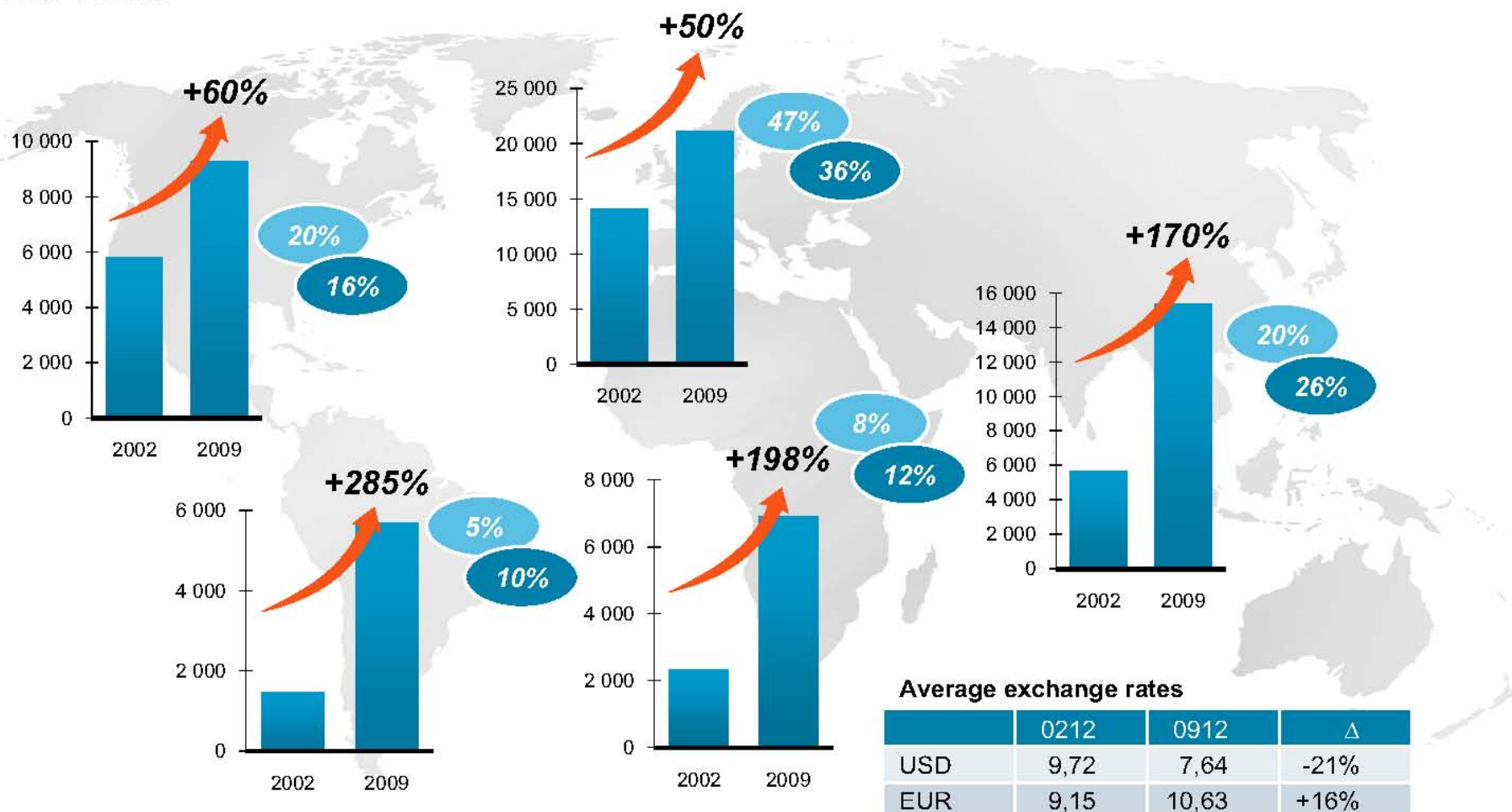
The Embrace Infant Warmer is a product with a mission.

an innovative infant warmer that costs less than 1% of a traditional incubator.



Worldwide presence 2002 vs 2009

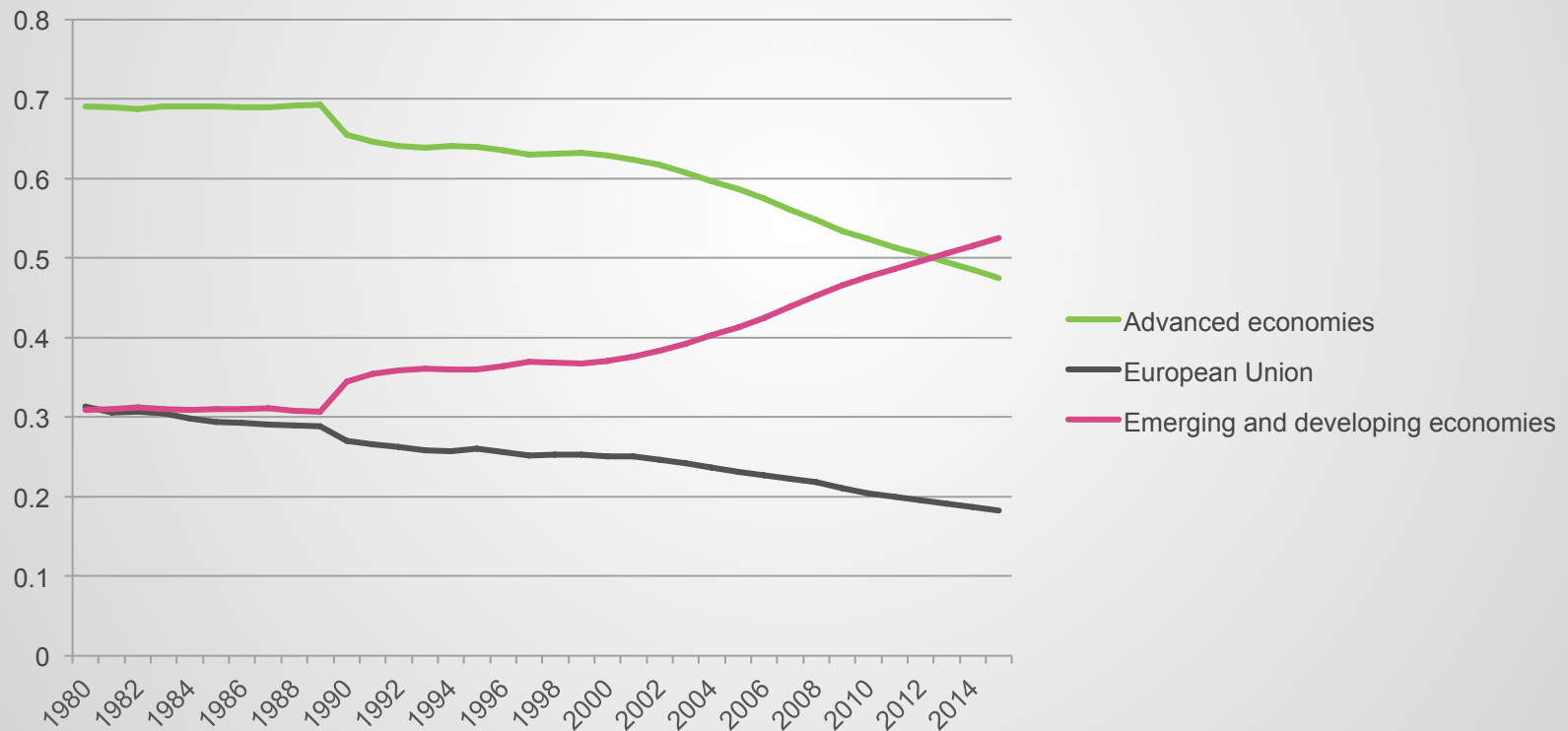
The Shift



Share of orders received 2002 (continuing operations)

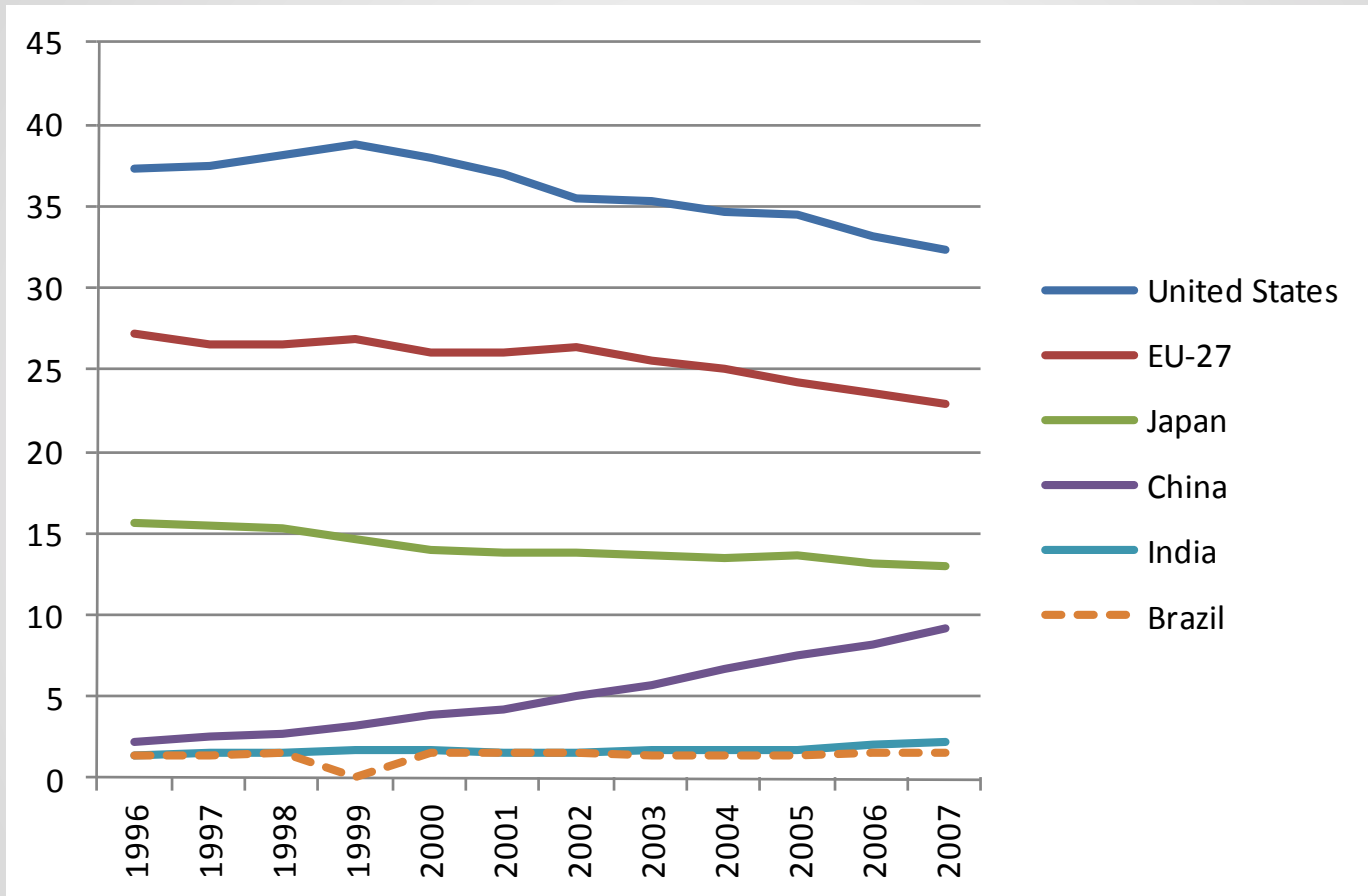
Share of orders received 2009

Share of Global GDP (PPP)



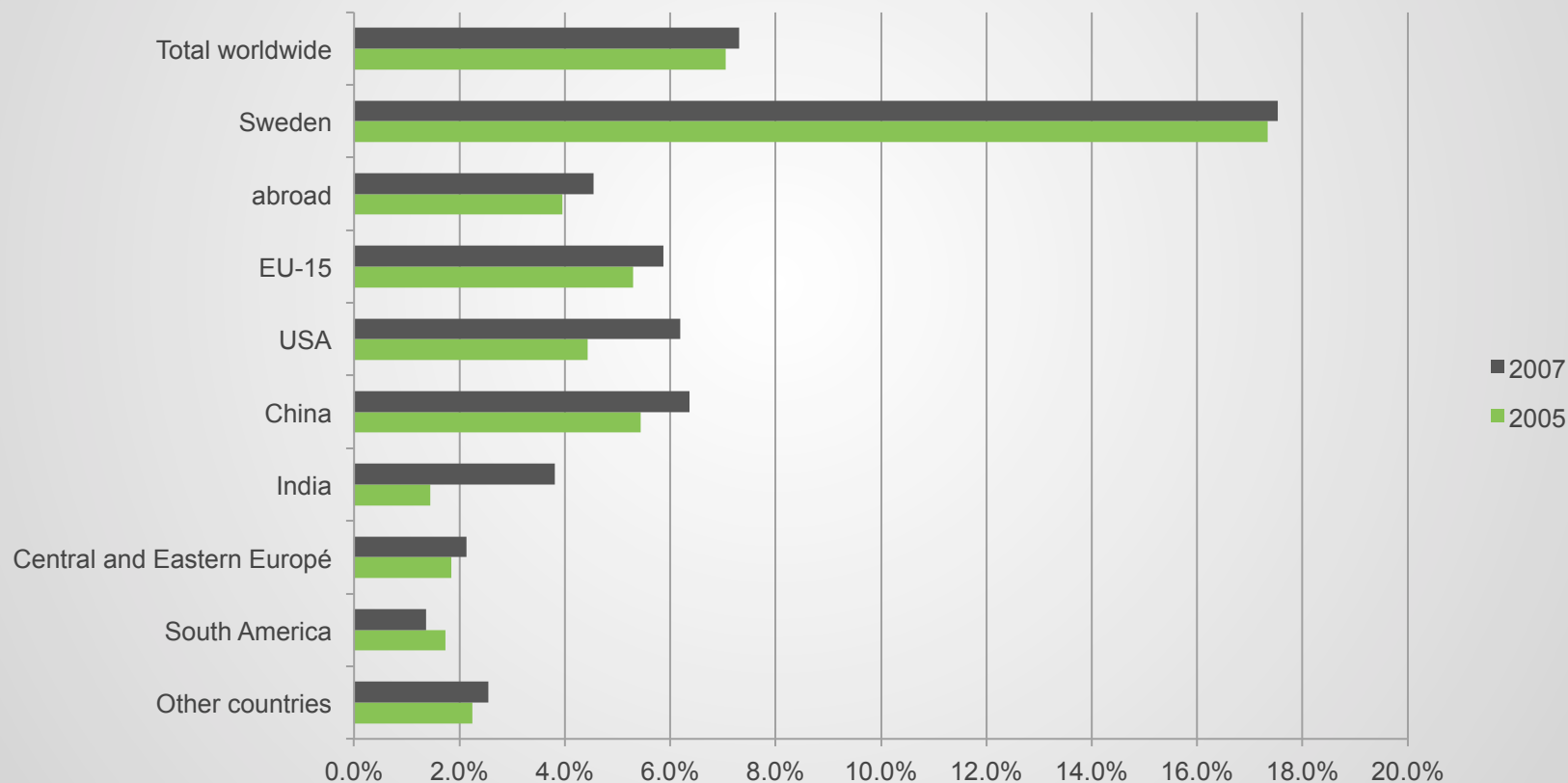
Source: IMF World Economic Outlook
accessed February 24 2011

Evolution of global share of total R&D, 1996-2007



Source: Based on data for 79 non-OECD countries (UNESCO Institute for Statistics) and 30 OECD countries (OECD Main Science and Technology indicators database 2009/2).

R&D intensity in large Swedish multinationals (R&D man-years as a share of total employees)



Source: Swedish Agency for Growth Policy Analysis (2009)

Large Swedish multinationals' R&D expenditure

	1997 (Million SEK)	2007 (Million SEK)	Average annual increase
Total worldwide	46 332	73 076	9,5%
Sweden	29 767	42 112	7,2%
EU 15	8 760	16 096	12,9%
North America	6 088	7 582	4,5%
China	2	1 229	261,2%
India	30	154	38,7%
Central and Eastern Europe	64	569	54,8%
South America	332	509	8,9%

Source: Swedish Agency for Growth Policy Analysis (2009)

Before	Today?
<p>Knowledge is created in universities; New technology is commercialized by big companies in OECD countries</p>	<p>Still true to a large extent BUT at the same time:</p> <p>Innovation increasingly happening in international networks and with new actors (SMEs, transition or developing countries, users)</p>
	<ul style="list-style-type: none"> •Chinese young middle class drives mobile services / online gaming •Coca Cola develops new drink in Shanghai •Tata develops new low-cost car in India •Solar-powered ATMs •Mechanically powered Fetal Heart rate monitor created expressly for rural and remote settings in the developing world. •Haier's potato/washing machine

Challenges at European level

- » Crisis makes Europe inward-looking
- » Attracting talent
- » Fragmentation of European policy-making
- » How to link research and innovation
 - *Framework Program*
 - *Internationalization*
- » Bottom-up funding vs strategic programs
- » Value-added of EU-level policies?

Recommendations of the European Research Advisory Board (ERAB) (selection)

» Pre-commercial RDI procurement

- *Exploit the huge, largely untapped potential of the public sector purchasing power (some 17 % of GDP) to drive innovation and stimulate private R & D, while at the same time enabling governments to perform their public tasks and address societal challenges more efficiently and effectively.*

» Concentrate RDI funding around a selection of themes relevant for 'Europe 2020: A strategy for smart, sustainable and inclusive growth'

- *Grand Challenges*

ERAB recommendations contd, p.2

- » Create a single market for research, development and innovation
 - *Pan-European pre-commercial procurement scheme*
 - *Enhance researcher mobility*
 - *Cross-border research funding*
 - *Pan-European graduate/research schools focused on grand challenges*
- » Create a European venture capital fund capable of investing in early-stage 'proof of concept' and business development prior to commercial investment
- » Make result and risk-oriented funding of research and innovation projects the dominant criterion for R&I funding of the EC

Sweden in Brief

» small:

- 9 million inhabitants but as large as France in terms of surface

» prosperous

- GDP ~ 36 960 USD per capita in PPP in 2008 (11th place 2009)
- Fastest growth in EU 2010

» equal:

- Gini coefficient of 0.25 compared; one of highest shares of women in parliament in the world (47%)

» open and transparent:

- imports plus exports ~ 80% of Sweden's GDP
- openness principle, strong institutions (IPR, social capital)

» environmentally conscious:

- Total emissions dropped by 17% since 1990

» innovative and competitive:

- 2nd most competitive (Global Competitiveness Report), most innovative country in EU (European Innovation Scoreboard)

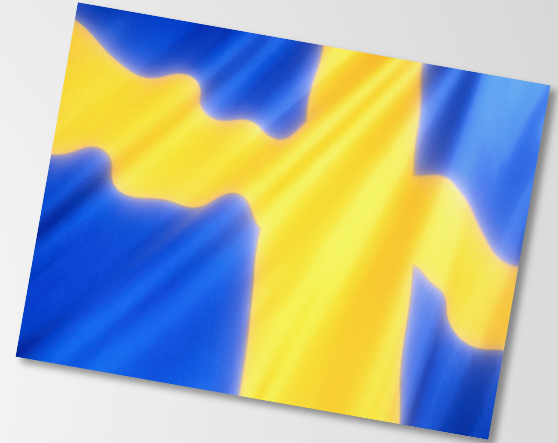
» world class science...

- Among top in the world in terms of publications and patenting per capita



Swedish Innovation System

- » Strong commitment to knowledge and learning
 - Public and private
 - Education and research
- » Strong tradition of academia-industry cooperation
- » System and user perspective
- » Bottom-up **and** top-down
- » High standard basic infrastructure
- » Long tradition of internationalization
- » Equality, transparency, efficiency – high social capital and strong institutions



**Expensive, small, cold
=> have to stay innovative to be attractive**

Sweden: challenges

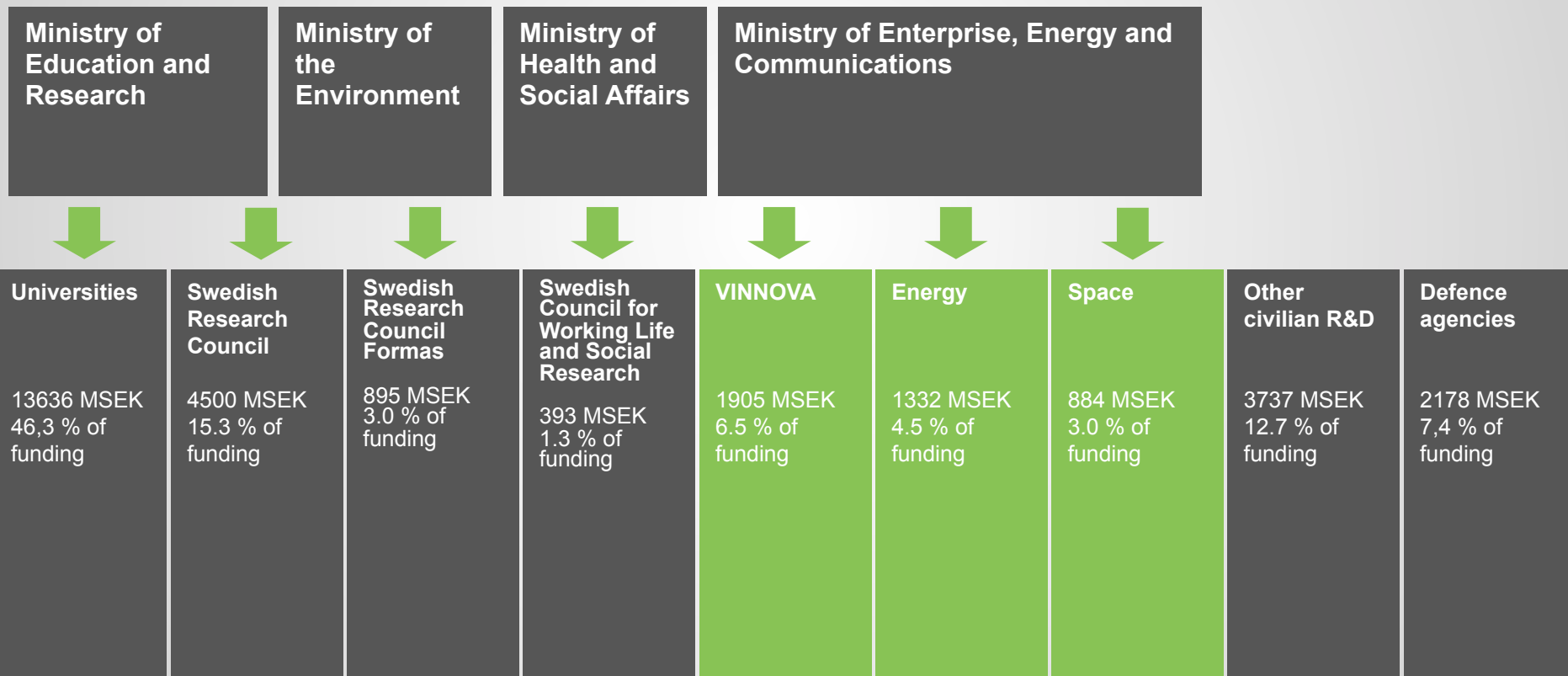
- » How to remain attractive to foreign R&D
- » How to maximize benefits from knowledge creation
 - Value creation in Sweden
 - Developing products for emerging markets
 - Being attractive for global talent
- » Less focus on technology-push research and more on demand-pull: two of Sweden's most successful companies in recent years have been H&M and IKEA!



Trends for research and innovation policy: Sweden

- » Challenge-driven innovation
- » Strengthening demand for innovation:
 - Innovation procurement
 - Lead markets
 - Engaging users
- » Promoting internationalization particularly for SMEs
- » Strengthening academy-industry linkages
- » Attracting and retaining talent and corporate R&D

Government R&D funding in Sweden distributed on receiving actor 2010



VINNOVA develops
Sweden's innovation
capacity for
sustainable growth





VINNOVA's role

Connect & Catalyse

Change of direction

from

to more of

Big firms



SME

Product &
technology



Services, design, process- and
business development

Universities



Society & Entrepreneurs

National focus



International linkages

Push



Pull

Societal challenges as a driver for innovation and growth

Future
healthcare



Future
information
society



Competitive
production



Sustainable and
attractive cities

Support universities in their transformation process

- » "Open up" academic research
- » New collaboration schemes between business and academia
- » Verification & testing
- » Engage students



"Re-activate" public innovation procurement

Thank you!

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