



STEM Talent Pipeline for Europe 2020-2050
EU Strategy for smart, sustainable and inclusive growth

Mathematics, Science & Technology Education: A European Coordinating Body

Hans van der Loo

Vice President European Union Liaison Shell International
European Round Table of Industrialists
University of Warwick – October 16th, 2010





European Round Table of Industrialists



Informal forum bringing together around 50 chief executive officers and chairmen of major multinational companies of European parentage

Companies of ERT Members are widely situated across Europe, with sales to EU customers exceeding Euro 1000 billion, thereby sustaining around 6.6 million jobs in the region



Chairman

Leif Johansson - Volvo

Vice-Chairmen

Gerard Kleisterlee - Royal Philips Electronics
Peter Löscher - Siemens

Paul Adams - British American Tobacco
César Alierta Izuel - Telefónica
Nils S. Andersen - A.P. Møller - Maersk
Léo Apotheker - SAP
Paulo Azevedo - SONAE
Jean-Louis Beffa - Saint-Gobain
Franco Bernabè - Telecom Italia
Wulf Bernotat - E.ON
Carlo Bozotti - STMicroelectronics
Peter Brabeck-Letmathe - Nestlé
Svein Richard Brandtzaeg - Norsk Hydro
David Brennan - AstraZeneca
Martin Broughton - British Airways
Antonio Brufau - Repsol YPF
Gerhard Cromme - ThyssenKrupp
Rodolfo De Benedetti - CIR
Thierry Desmarest - TOTAL
Bülent Eczacıbaşı - Eczacıbaşı Group
John Elkann - Fiat
Carlos Ghosn - Renault
Jürgen Hambrecht - BASF
Antti Herlin - KONE Corporation
Zsolt Hernádi - MOL
Franz Humer - F. Hoffmann-La Roche
Pablo Isla - Inditex
Olli-Pekka Kallasvuo - Nokia
Bruno Lafont - Lafarge
Thomas Leysen - Umicore
Ian Livingston - BT
Gary McGann - Smurfit Kappa Group
Gérard Mestrallet - GDF Suez
Alois Michielsen - Solvay
René Obermann - Deutsche Telekom
Dimitri Papalexopoulos - Titan Cement
Paul Polman - Unilever
Benoît Potier - Air Liquide
Wolfgang Rüttenstorfer - OMV
Güler Sabancı - Sabancı Holding
Paolo Scaroni - Eni
Jean-François van Boxmeer - Heineken
Ben Verwaayen - Alcatel-Lucent
Peter Voser - Royal Dutch Shell
Jacob Wallenberg - Investor
Hans Wijers - AkzoNobel

Secretary General

Wim Philippa

WORLDWIDE PRESENCE

EXPLORATION & PRODUCTION



Malaysia



Canada Oil Sands



Gulf Of Mexico

OIL PRODUCTS & CHEMICALS



V-power Diesel



India Retail Station



Chemicals China

GAS & POWER



LNG Site Nigeria



China Coal Gasification



LNG Shipping

ALTERNATIVE ENERGIES



Offshore Wind Netherlands



Hydrogen Iceland



Advanced Biofuels



SECURITY



CARBON

RESOURCES

TECHNOLOGY

ENERGY

A People-Centred Map of the World



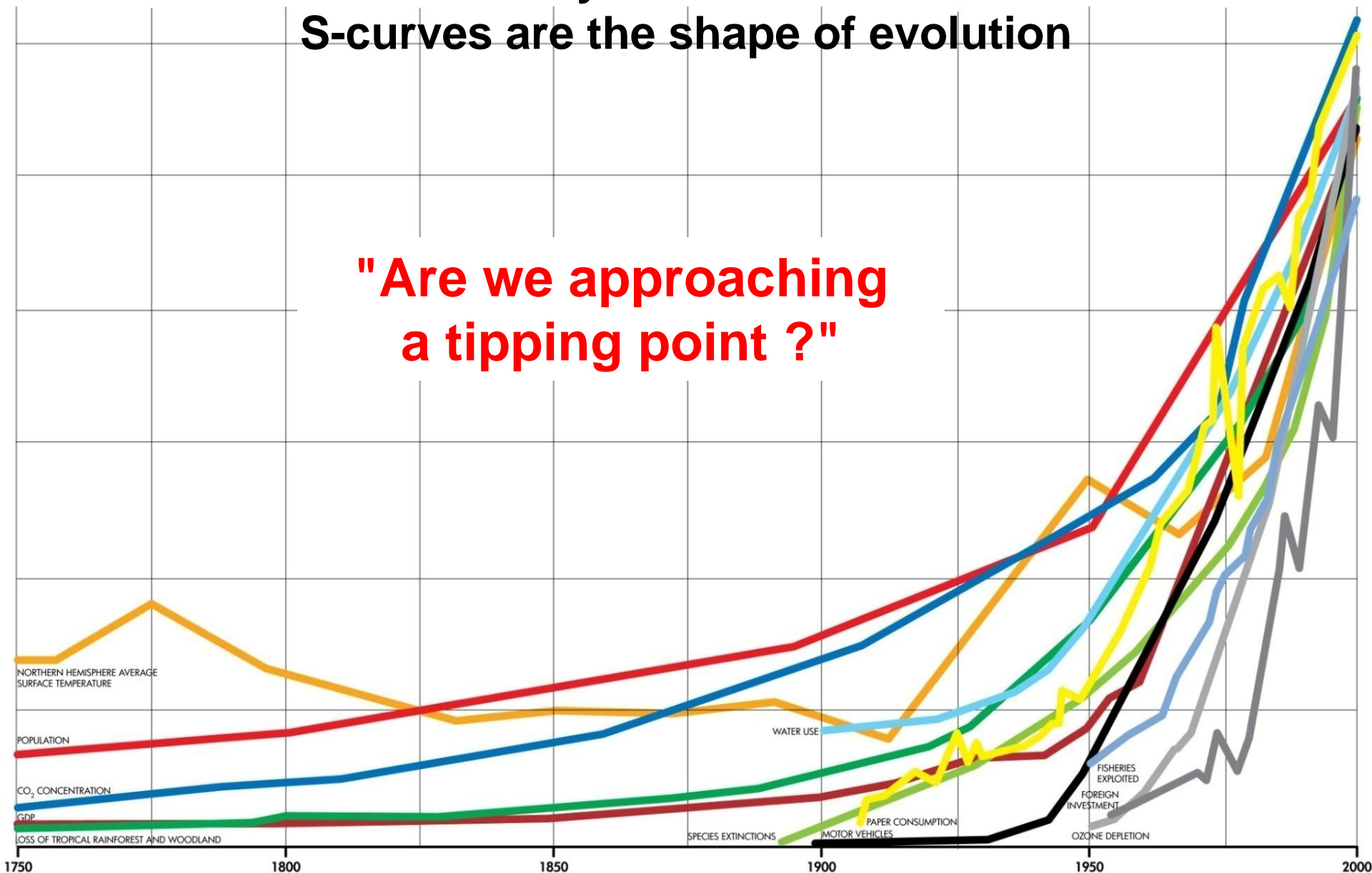
Year 2000; Source Mark Newman, University of Michigan

Accelerating & Fundamental Change

J-curves only exist in mathematics

S-curves are the shape of evolution

"Are we approaching
a tipping point ?"



**By 2050 the World
needs 2x more Energy*
and 2x less CO₂**

***Resources**

“The Perfect Storm”*

Professor Sir John Beddington
Chief Scientific Advisor to UK Government

- Research shows a whole series of events coming together in the next 15-20 years:
 - The world's population will rise from 6bn to 8bn (33%)
 - Demand for food will increase by 50%
 - Demand for water will increase by 30%
 - Demand for energy will increase by 50%
- Research foresees each problem combining to create a “perfect storm” in which the whole is bigger, and more serious, than the sum of its parts.

Talent & Education

Crucially important for Europe*

- **Source for new solutions /eco-innovations**
- **Societal acceptance of new technologies**
- **Platform for future EU prosperity**

Driving today's and tomorrow's Carbon Footprint & Resource Efficiency

Encouraging fuel efficient driving

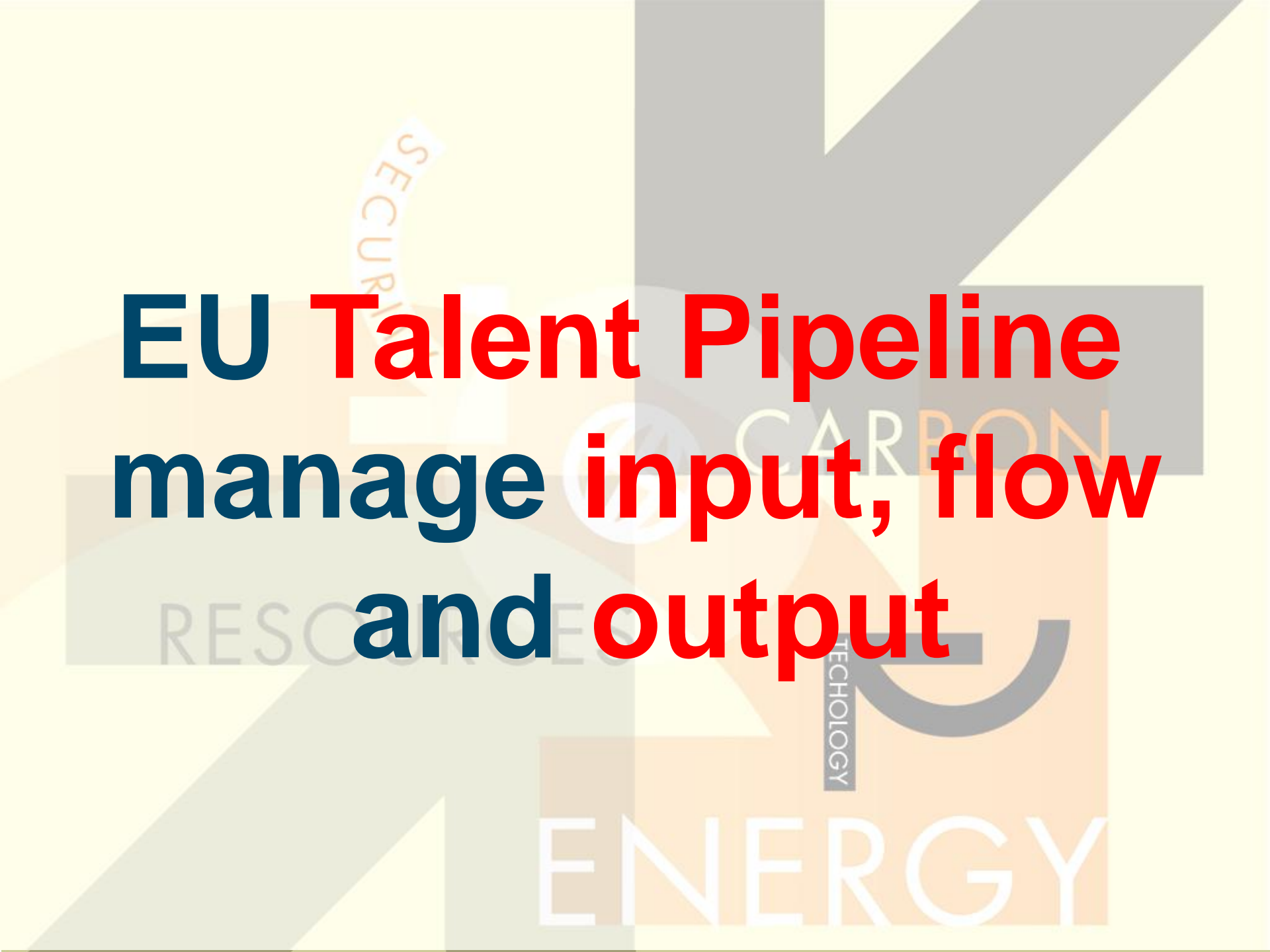


- Shell sets new **Guinness World Record** for Fuel Economy – **circled the globe** covering 28,970kms, across 25 countries, in 70 days, achieving **22 km/litre**
- More info on www.fuelchallenge.com

Inspiring the next generation engineers



- **Shell Eco Marathon** - 3000 participants from 250 teams from around the world **push the boundaries of sustainability mobility**
- Current record is **3880 km/litre**
- More info on www.shell.com/eco-marathon

The background features a complex arrangement of overlapping geometric shapes in shades of yellow, orange, and grey. Faint, semi-transparent text elements are scattered throughout, including 'SECURITY' (curved), 'CARBON' (horizontal), 'RESOURCES' (horizontal), 'TECHNOLOGY' (vertical), and 'ENERGY' (horizontal).

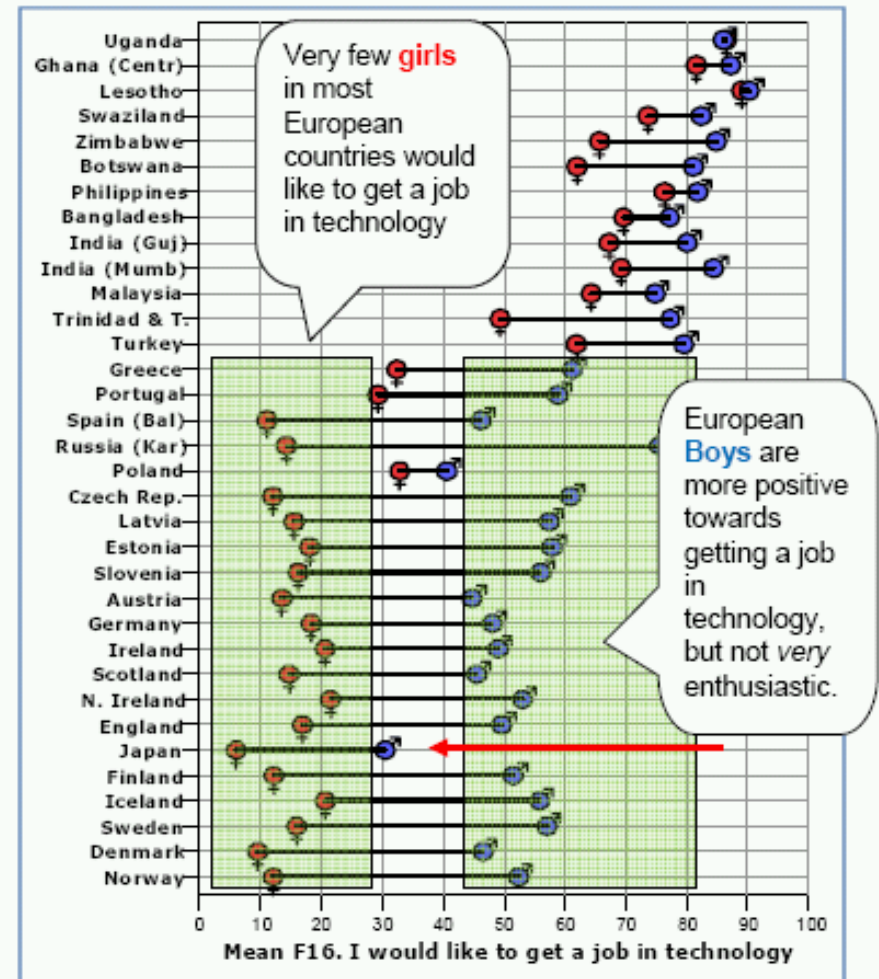
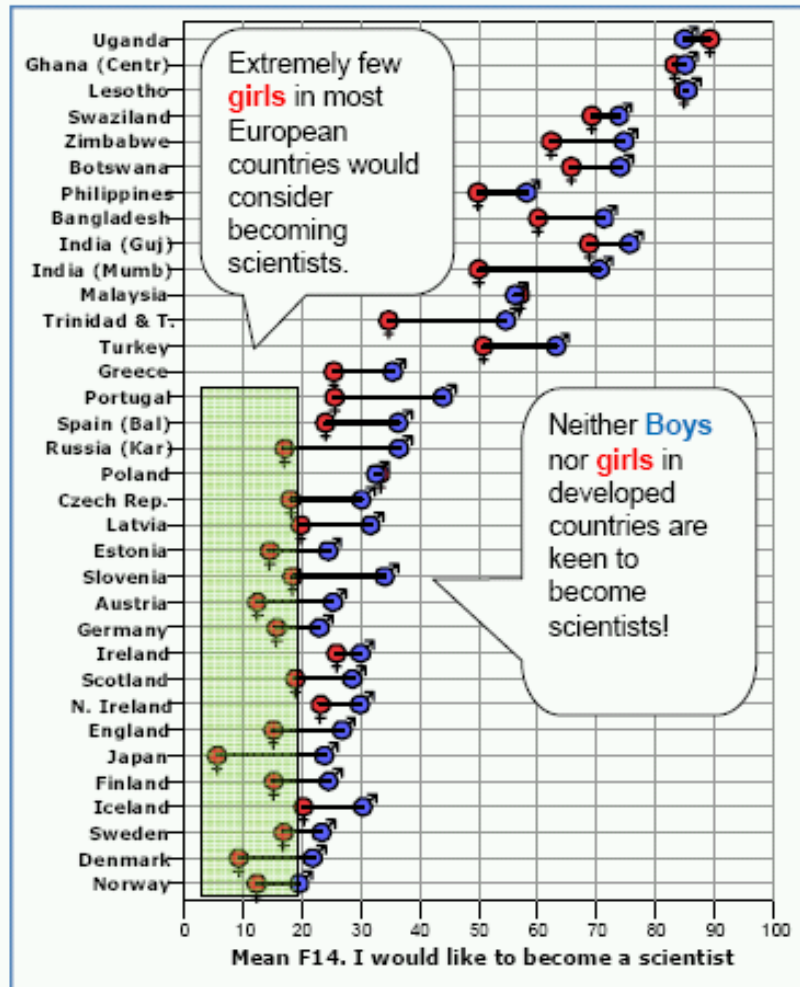
EU Talent Pipeline **manage input, flow** **and output**

Underlying Assumptions

- Society's most **valuable resource** is **Human Ingenuity**
- Societies should **allocate Talent to most pressing challenges**
 - Resource demand acceleration (energy, food, water, etc)
 - Climate Change consequences
- Think about **Talent** in terms of **Pipeline Management**
 - Long leadtimes from 6-14 to 25-30 years of age
 - Monitor early warning wignals
 - Great accuracy now / High probability later
- **Act early** to avoid problems later

ROSE Study : Relevance Of Science Education

POSSIBLE RECRUITMENT TO SCIENCE, ENGINEERING AND TECHNOLOGY?



The **Talent** Challenge, Europe will face large scale STEM competence disparities

European stakeholders need to coordinate efforts

- Declining STEM student proportion
- Stabilisation of access to tertiary education
- Unfavourable demographic trends
- Hesitant attitudes



Nobelprize winners **2060** ?
How can we help them **now** ?

Understanding Cause & Effect

Challenges requiring the collaboration of Schools and Industry

•Students

- lack* rationale for education and work in STEM

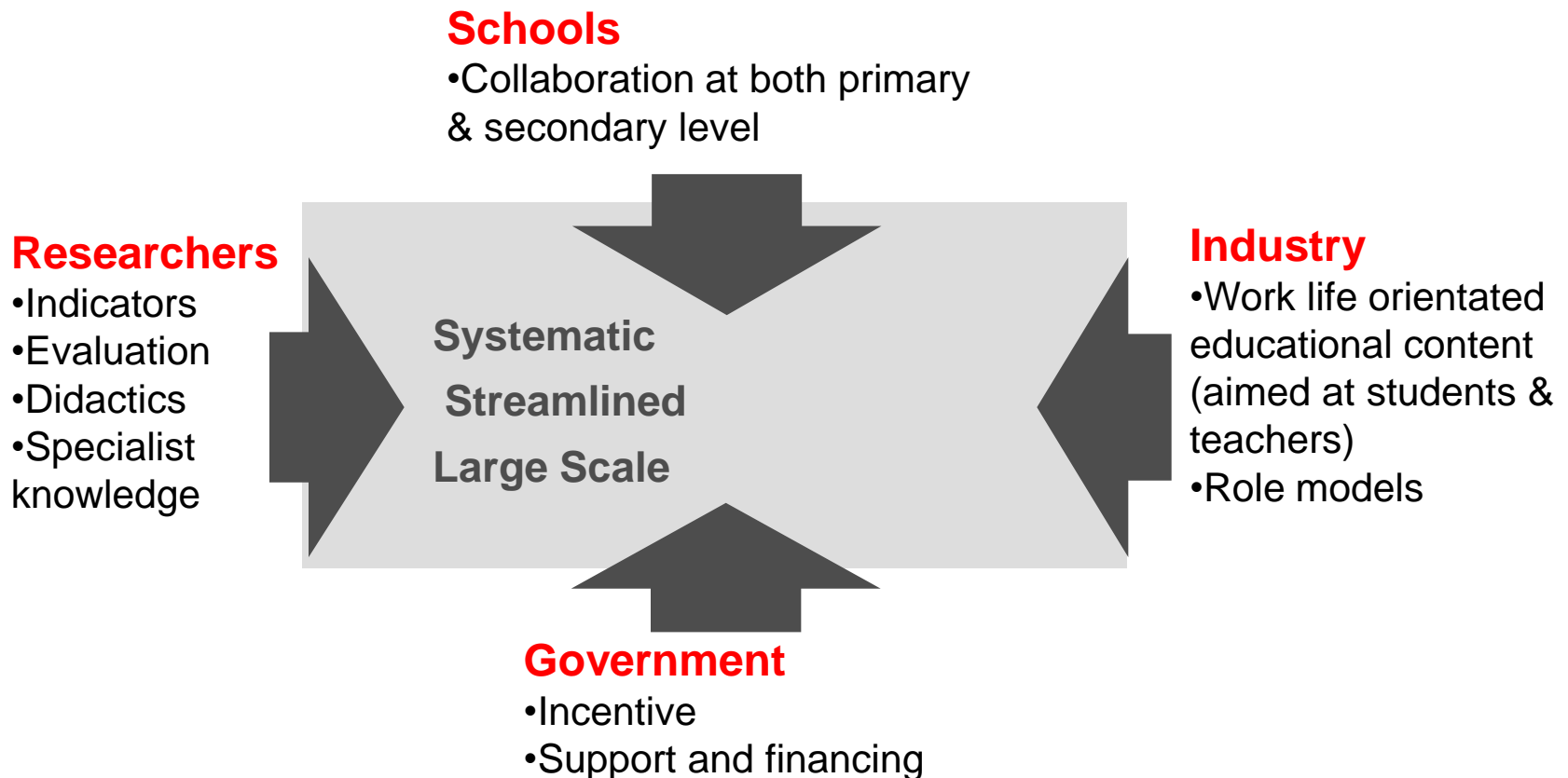
- lack* role models in working life

•Teachers

- lack* information on use of STEM in working life

The Strategy

Multi-Stakeholder Commitment



ERT believes business has an increasingly important role to play

**Partnership between education and business
to support students and teachers**



Partnerships should provide

- Meaningful life and career contexts
- Role models
- Career information

Differentiating depending on

- Age and school level
- Topic, culture and geography

ERT High Level Multi-Stakeholder Event

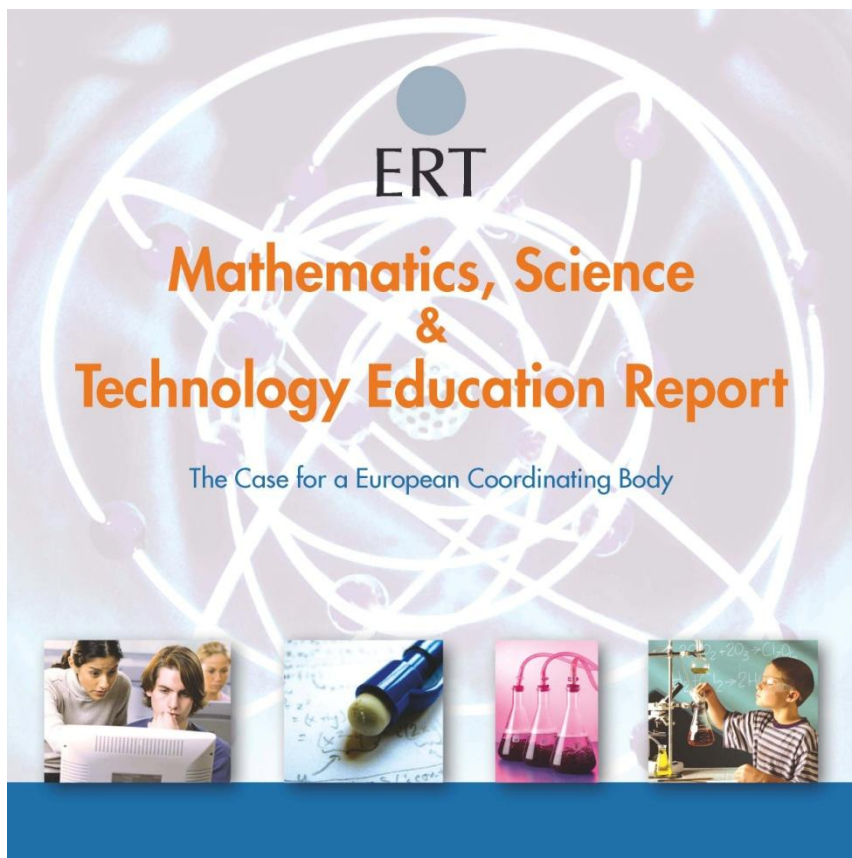
Input into Europe 2020 strategy



Conclusions

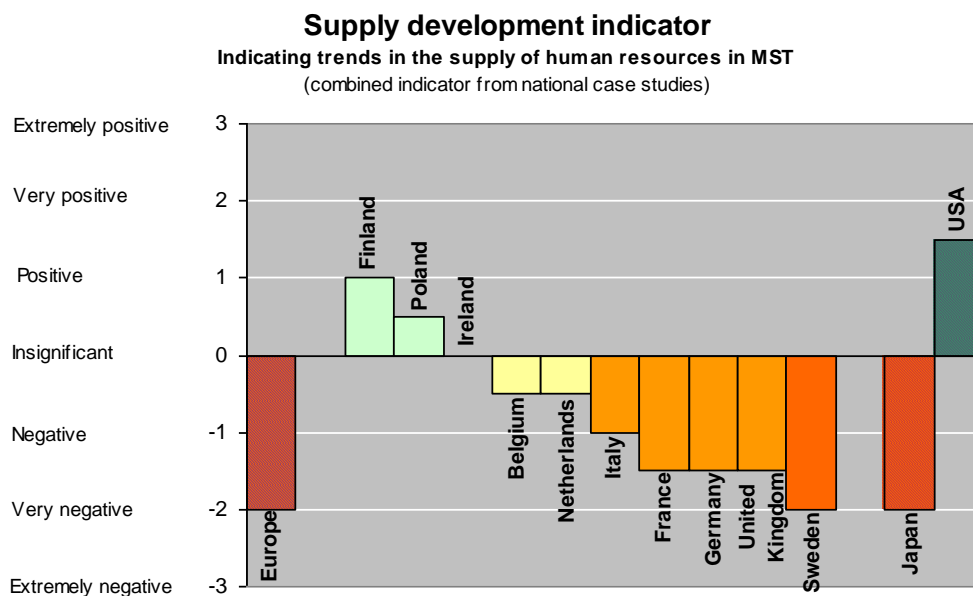
- Act as catalyst for education/business initiatives at national and local levels
- Help create a European Coordinating Body
- Engage with the OECD to establish indicators
- Continue to take leadership on promoting STEM careers

ERT MST Education Report



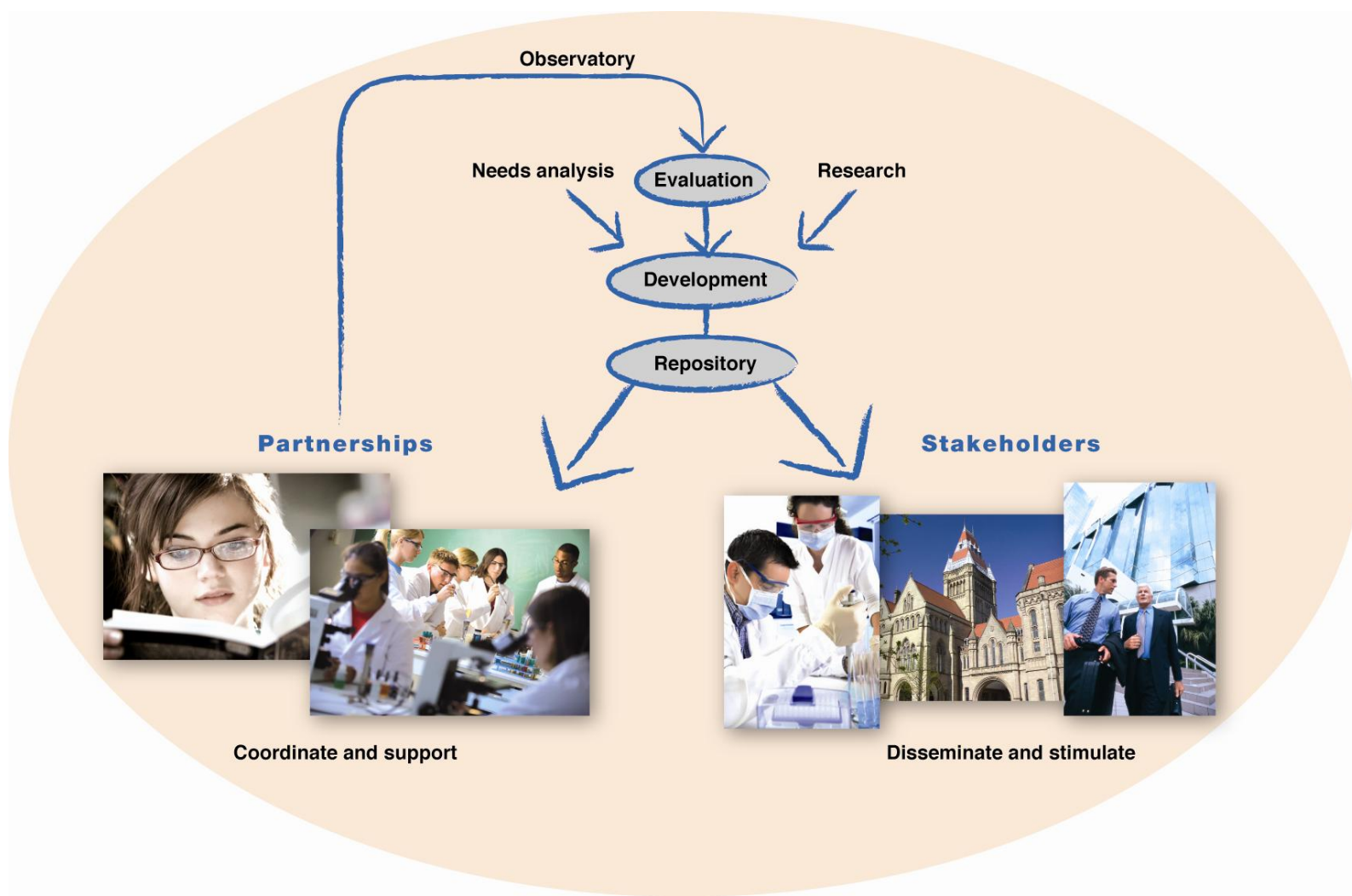
Published September 2009

Addressing the role business might have in the problem and should play in the solution



“A European strategy for	EUROPE 2020 smart, sustainable and	inclusive growth”
Employment, Research,	5 Headline Targets Climate/Energy, Reduce poverty 3 Priority Areas :	Reduce early school leavers
SMART Growth	SUSTAINABLE Growth	INCLUSIVE Growth
<u>Innovation</u> Innovation Union	Climate, Energy and Mobility Resource Efficient Europe	<u>Employment and Skills</u> Agenda for new skills and jobs
<u>Education</u> Youth on the move	Competitiveness Industrial policy for the globalisation era	Fighting Poverty EU platform against poverty
Digital Society A digital agenda for Europe		

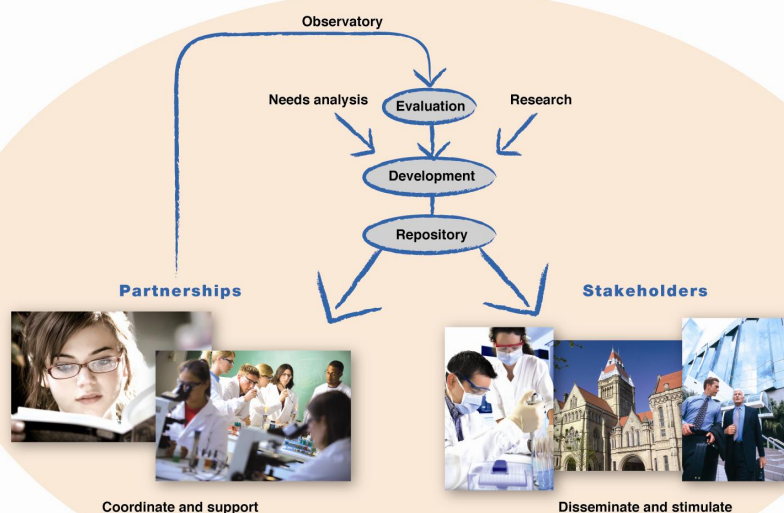
A European Coordinating Body



A European Coordinating Body

The main deliverables of the ECB will be:

- Observatory of practices
- Evaluation of current partnerships
- Needs analysis to identify gaps in current partnerships
- Research
- Annual synthesis report of relevant published research
- Interviews
- Focus groups
- Repository of good practice
- Community platform
- Coordination meetings
- Matching tool
- Special interest groups
- Professional development for teachers
- Multilingual web portal in 8 languages
- European level campaign and conferences



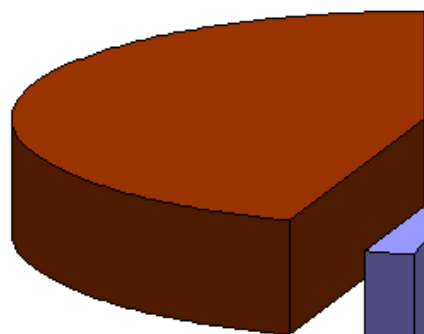
FP7 Call for Proposal

Establishing the European Coordinating Body

European Coordinating Body

PROPOSED 3 year TOTAL BUDGET: €8'935'000

European Commission
(€4'000'000)



CONSORTIUM OF LEGAL PARTNERS
(cash + in kind) x number of entities

Ministries of Education
(€100'000 + €0) x 5 per year

ERT Companies
(€15'000 + €50'000) x 5 per year

National Platforms
(€0 + €50'000) x 5 per year

Universities
(€0 + €100'000) x 1 per year

ECB MEMBERS

(cash + in kind) x number of entities

Corporate Members

ERT Companies
(€15'000 + €20'000) x 10 per year

Advisory Members

Industry Associations, eg. ERT,
BusinessEurope, CEFIC
(€20'000 + €0) x 3 per year

General Members

(€2'000 + €0) x 30 per year

Establishing the European Coordinating Body

Current Partners and Stakeholders



MATENA

SIEMENS



The background is a complex collage of geometric shapes in shades of yellow, orange, and grey. Overlaid on this are several text elements: 'SECURITY' in a curved, orange font at the top left; 'CARBON' in a yellow and orange font in the upper middle; 'RESOURCES' in a grey font in the lower middle; 'TECHNOLOGY' in a vertical grey font on the right; and 'ENERGY' in a large white font at the bottom. A faint globe icon is also visible in the center.

**"It is not necessary to change.
Survival is not mandatory."**

W. Edwards Deming

Conclusion



- Education essential for European competitiveness and future growth and prosperity
- Partnerships between education and business have a key role to play
- Partnerships need support and encouragement
- ERT members are prepared to further engage in partnerships to aid in achieving EU targets
- A European Coordinating Body would provide substantial support to partnerships across Europe
- Europe needs to take action now, despite the current economic climate