1. Today’s EU challenges & main strategies
1.1 THE XXIst CENTURY CHALLENGES
1.2 ANALYSIS: LONG TERM EUROPEAN TRENDS
1.3 RESPONSE: THE EUROPE 2020 GROWTH STRATEGY

2. Growth and Innovation in the EU
2.1 ANALYSIS : THE INNOVATION UNION SCOREBOARD
2.2 RESPONSE : THE INNOVATION UNION (2010-2020)

3. Brainstorming
"Nano-info bio vs. The great Transition,
a Museum Europe or Europe as a Muse for a new Renaissance?"
1. Today’s EU challenges & main strategy

1.1 THE XXIst CENTURY CHALLENGES
**THE XXIst CENTURY CHALLENGES - 1**

**ECONOMIC DRIVERS**

- **Globalisation of the economy**
  - Industrial technologies allow production with less skills and staff
  - Information technologies changed space/time relationship
  - Liberalisation of commerce, trade, services.... People

- **Increasing technological content of products and services**
  - Required to differentiate from global competition
  - A must to face the pace of technological change
  - An option to embed knowledge in mobile goods & services

- **Widening of the knowledge base required for core business**
  - Need to simultaneously:
    - Internationalise strategy
    - Modernise production systems and products
    - Widen networks of knowledge suppliers

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**Teresa Gonceiro in Portugal**

**Less than 2% mobile in EU**

**Apollo XIII(’68) -> VW Passat (94) -> Washing machine(’04)**

**Competition between product & service eco-systems : iPhone<> Android<>Nokia**

**Biotechnology & Cooking for Bread**

**Laser Welding for Bicycles**

**Marble for planes, bought by Internet on ships**
THE XXIst CENTURY CHALLENGES - 2

SOCIAL DRIVERS

◆ Demography: European society is aging rapidly
  – Fear of change, less dynamism
  – New needs (and potential) e.g. in health and mobility

◆ Quest for quality/sustainable development/individual needs
  – Social constraints are also opportunities in the European society
    (Quality/Quantity, Security/Risk, Solidarity/Freedom)

◆ Difficulties of democratic governements
  – Democracy is slow and complex, consensus making takes time
  – Social dialogue is less representative of society (Less stable govs., Less
    representative unions and business associations)
  – National values are less clear, need to do things together but why?

☞ A new role for Government? Facilitate change and address Major
  Societal Challenges (Climate Change, Demographic Change, Safe
  Energy and food supply, Citizen security…)

Democracy is dictatorship of majority: 50% of It voters will be pensioned in 2012
Who needs a 3rd fridge? Food and pharma innovation
Is solidarity in the EU dead?
THE XXIst CENTURY CHALLENGES - 3

GLOBAL ORDER DRIVERS

◆ Globalisation of risk
  – Probability for war has lowered, but threat has increased
  – Power of destruction has increased, one can threaten many

◆ Local instability can influence the world
  – Need to care for local economy
  – Need to care for local democracy
  – Need to care for local health

◆ Multilateralism is gaining pace
  – The Olympic Committee: 6.4 Billion people from 203 Countries (‘10)
  – The Unites Nations: 6.3 Billion people from 192 Countries (‘10)
  – The World Trade Organisation: 5.8 Billion people (150 Countries) (‘10)

◆ War is not a solution: it only makes matters worse
  – Unilateralism does not work: Irak, Haiti, Somalia (+) Slovenia & Slovakia
  – Yugoslavia, Afghanistan, Sudan?

☞ Need for a new global order
1. Today’s EU challenges & main strategy

1.1 THE XXIst CENTURY CHALLENGES

1.2 ANALYSIS: LONG TERM EUROPEAN TRENDS
LONG TERM EUROPEAN TRENDS - 1

SERVICES PLAY A GROWING ROLE

1950

Employment

1950

Gross Nat° Income

2005

65% in Services
No Single Market

32% in Industry
Single Market

3% in Agric. & Fish.
Union Policy

60% in Services

38% in Industry

2% in Agric. & Fish.
LONG TERM EUROPEAN TRENDS - 2

GNI / CITIZEN STOPPED CATCHING-UP

*Abb. 1: EU-Pro-Kopf-BiP in KKS (zu konstanten Preisen von 1995)*

(US = 100)

*Quelle: Dienststellen der Kommission, Prognosen 2004-2005*
LONG TERM EUROPEAN TRENDS - 3
EMPLOYMENT RATES STOP CATCHING-UP

Taux d'emploi de l'UE, des EU et du Japon, 1975-2003

Source: DG EMPL calculation based on long-term trends in employment and population, Commission Services

Uni TRENTO / Crash course on Research funding...

Teach/Trento/Inno & Growth - 4/12
LONG TERM EUROPEAN TRENDS - 4
REAL INCOME & PRODUCTIVITY, Work vs Leisure

GDP per head of population - 000 €
Source: Eurostat - 2004

GDP per person employed - 000 €

GDP per hour worked - €

Source: Eurostat - 2004
LONG TERM EUROPEAN TRENDS - 5

PRODUCTIVITY GROWTH SLOWS DOWN

Abb. 2: Wachstum der Arbeitsproduktivität pro Stunde
(gleitender Durchschnitt)

Quelle: EU-Kommission, AMECO-Datenbank
LONG TERM EUROPEAN TRENDS - 6
GROWING RESEARCH & INNOVATION GAP

INNOVATION AND RESEARCH
5 GERD (Gross domestic expenditure on R&D)
As a percentage of GDP

IT Expenditure
As a percentage of GDP

Source: E/TO
LONG TERM EUROPEAN TRENDS - 7

AN INCREASING OLD AGE DEPENDENCY

Old dependency ratio
(age group 65+ as share of age group 15-64)

Green Paper on Demography

1 B$ year in National Ageing Institute?

20 Million humanoid robots in 2030?

Source: UN World Population prospects (2002 Rev. - Medium Variant); For EU25 : Eurostat 2004 Demographic Projection (Baseline scenario); CC= BG, RO, HU, TR
LONG TERM EUROPEAN TRENDS - 8

A NEW GENERATIONAL DEAL

1889 Bismarck "old age" bill For 70 years workers…

... an age most Germans would never reach

Pension at 65, still only lasted for 3 years for most Germans in 1950…

...10 years in 1975…

...and 15 in 2000!
1. Today’s EU challenges & main strategy

1.1 THE XXI\textsuperscript{st} CENTURY CHALLENGES

1.2 ANALYSIS: LONG TERM EUROPEAN TRENDS

1.3 RESPONSE: THE EUROPE 2020 GROWTH STRATEGY
EU RESPONSES to A CHANGING WORLD

TWO SETS of 10 YEAR STRATEGIES

- 2000 – White paper on Governance
  - The EU can lead on soft issues
  - The EU can lead on medium term

- 2001-2010 “Lisbon Strategy”
  - A competitive knowledge society

- 2006 – Revised Lisbon Strategy
  - Priority to growth and jobs

- 2010 – The EU 2020 Growth Strategy
  - Smart and Innovative Growth
  - Clean and Sustainable Growth
  - Inclusive and Global Growth

"Our clear aim is to achieve more and better jobs in a more dynamic, innovative and attractive Europe. With this strategy I believe we now have the right tools to achieve our goals."
GLOBAL OBJECTIVES FOR ALL POLICIES

◆ “Combining competitiveness that stimulates, solidarity that unites and co-operation that reinforces” (White Paper on Growth, Competitiveness and Employment, Jacques Delors - 1993);

◆ “EU to become the most competitive and dynamic knowledge based economy in the world, capable of sustainable growth with more and better jobs and greater social cohesion” (Lisbon Strategy - March 2000);

◆ “Growth & innovation for sustainable development. Based on balanced growth, price stability+highly competitive social market economy. Promoting full employment & social progress, a high level of social protection & environmental quality” (Spring 2005)

◆ “Smart, sustainable and inclusive growth” (EU 2020 Strategy, March 2010)
EUROPEAN XXI\textsuperscript{st} CENTURY STRATEGIES - 2

LISBON TRIANGLE & STRATEGY (2000)

SOCIAL

\textit{Living standards - Social cohesion}

ECONOMIC

\textit{Competitiveness - Dynamism}

EMPLOYMENT

\textit{Full employment - Quality of work}
EUROPEAN XXIst CENTURY STRATEGIES - 3

LISBON TRIANGLE & STRATEGY (2000)

SOCIAL
Living standards - Social cohesion

ECONOMIC
Competitiveness - Dynamism

EMPLOYMENT
Full employment - Quality of work

Knowledge based economy
Research, Innovation, Education, LLL

Sustainable Development
Energy, Transport & Environment
EUROPEAN XXIst CENTURY STRATEGIES - 4
A FOCUS ON GROWTH & INNOVATION (2005)

Knowledge based economy
Research, Innovation, Education, LLL

Sustainable Development
Energy, Transport & Environment

ECONOMIC
Growth - Competitiveness - Dynamism – Innovation - Single Market

SOCIAL
Inclusion- Cohesion Sustainability

EMPLOYMENT
Full employment
Quality and productivity of work

April 2011 - 21
E U R O P E  2 0 2 0

Presentation of J.M. Barroso, President of the European Commission, to the Informal European Council of 11 February 2010
REACTING TO THE FINANCIAL CRISIS

1. The crisis has wiped out long-term progress
2. Europe must react to avoid decline
3. Our room for manoeuvre is constrained
4. We must learn the lessons and turn to the future
5. Where do we want Europe in 2020?
6. From exit to lasting recovery
7. Three priorities for sustainable growth and jobs
The crisis has wiped out progress

- GDP growth: -4% in 2009, worst since the 1930s
- Industrial production: -20% with the crisis, back to the 1990s
- Unemployment levels:
  - 23 million people
  - 7 million more unemployed in 20 months
  - expected to reach 10.3% in 2010 (back to 1990s level)
  - youth unemployment over 21%
Europe’s growth was severely hit

Annual GDP growth (%)

Source: European Commission

Presentation of J.M. Barroso to the Informal European Council, 11 February 2010

Uni TRENTO / Crash course on Research funding...
Unemployment has spread

Unemployment rates in the EU, December 2009
(and increase since March 2008)

Source: European Commission
Notes: * UK: October 2009; ** EE, EL, LT and RO: third quarter 2009

Presentation of J.M. Barroso to the Informal European Council, 11 February 2010
Uni TRENTO / Crash course on Research funding...
Europe must react to avoid decline

ٖOur growth potential has been halved by the crisis:
if we do nothing, we will end the decade with very low economic growth

ٖAgeing is accelerating: our working age population will be reduced by about 2 million by 2020, and the number of 60+ is increasing twice as fast as before 2007

ٖProductivity levels are lagging behind: two-thirds of our income gap with the US is due to lower productivity
Our room for manoeuvre is limited

- Our public finances are very severely affected: deficits at 7% GDP on average and debt levels at over 80%; 2 years wiped out 20 years of consolidation

- Our financial system still needs fixing: reduced bank lending is still holding back recovery

- Global competition is fierce: EU share of global exports is declining relative to China and India
Global competition is fierce

Export share (% world exports)

Source: European Commission

Presentation of J.M. Barroso to the Informal European Council, 11 February 2010

Uni TRENTO / Crash course on Research funding...
Different starting conditions in 2010

Public debt / external account deficit

Annual Growth Survey, European Commission, 12 January 2011
We must learn the lessons

◆ Our economies are interdependent: up to 70% of car components for each car produced in the EU come from other Member States; overall, for € 1000 of growth in a Member State, around € 200 goes to other Member States via intra-EU trade

◆ In the crisis, the need for coordination became obvious; it is even more crucial for our recovery: decisions taken in one Member State impact the others

◆ The EU adds value: we should build on our strengths - the internal market, the euro - and on our leadership in the G20
Intra-EU trade is high and growing

Intra-EU and extra-EU exports of goods

- Intra-EU exports of goods in billion euros
- Extra-EU exports of goods in billion euros

<table>
<thead>
<tr>
<th>Year</th>
<th>Intra-EU</th>
<th>Extra-EU</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999</td>
<td>1,528</td>
<td>683</td>
<td>2,211</td>
</tr>
<tr>
<td>2008</td>
<td>2,706</td>
<td>1,307</td>
<td>4,013</td>
</tr>
</tbody>
</table>

Source: European Commission

Presentation of J.M. Barroso to the Informal European Council, 11 February 2010

Uni TRENTO / Crash course on Research funding...
Our futures are interlinked

Relation between EU imports and exports of goods

- Growth in extra EU-27 exports of capital and consumption goods
- Growth in EU-27 imports of intermediate goods from China, excluding fuels
- Share of China in EU-27 imports of intermediate goods (end of period)

Source: European Commission

Presentation of J.M. Barroso to the Informal European Council, 11 February 2010

Uni TRENTO / Crash course on Research funding...
Where do we want Europe in 2020?

- **“Strong recovery”**
  a full return to earlier growth path and a capacity to go beyond

- **“Sluggish recovery”**
  a permanent loss in wealth and stagnation on a lower growth path

- **“Lost decade”**
  a permanent loss in wealth and an eroded potential for future growth

Presentation of J.M. Barroso to the Informal European Council, 11 February 2010
From exit to lasting recovery

- The “exit” means the entry into a different economy: we will not return to the situation before the crisis

- We must face up long-term realities – globalisation, pressure on resources, ageing, technological trends – and tap our full potential

- 2020 starts now: our recovery efforts must pave the way for sustainable growth and fiscal consolidation

Presentation of J.M. Barroso to the Informal European Council, 11 February 2010
Acting together at EU level pays off

Medium-term impact (2020) on EU GDP of specific EU-level measures – model simulations.

- Venture capital (removal of cross-border regulatory and tax barriers): 94
- 25% reduction in administrative burden (EU contribution equal to 35% of overall reduction): 75
- Services Directive (conservative estimate): 63
- Unbundling electricity markets: 50

Source: European Commission

Presentation of J.M. Barroso to the Informal European Council, 11 February 2010
Three priorities for sustainable growth and jobs

◆ Growth based on knowledge and innovation
  – Innovation
  – Education
  – Digital society

◆ An inclusive high-employment society
  – Employment
  – Skills
  – Fighting poverty

◆ Green growth: a competitive and sustainable economy
  – Combating climate change
  – Clean and efficient energy
  – Competitiveness
### Growth based on knowledge and innovation

<table>
<thead>
<tr>
<th>INNOVATION</th>
<th>EDUCATION</th>
<th>DIGITAL SOCIETY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Key facts</strong></td>
<td><strong>Key facts</strong></td>
<td><strong>Key facts</strong></td>
</tr>
<tr>
<td>• R&amp;D spending is below 2%, compared to 2.6% in the US and 3.4% in Japan; our smaller share of high-tech firms explains half of the gap with the US.</td>
<td>• Less than 1 person in 3 aged 25-34 has a university degree, compared to 40% in the US and over 50% in Japan.</td>
<td>• The world market in information and communication technologies is worth €660 billion and employs 1/3 of research workforce: EU firms make up only 23% of this.</td>
</tr>
<tr>
<td>• Google spends more on information and communication technologies R&amp;D than the EU FP7 does.</td>
<td>• 1 in 7 young people drop out of school, and 1 in 4 have poor reading skills.</td>
<td>• 56% of households have a broadband connection, but many users have doubts about safety and financial transactions on the internet.</td>
</tr>
</tbody>
</table>

**Innovation Union**
- R&D/GDP = 3% (from 2%)

**Youth on the Move**
- 40% tertiary ed. (from 31%)

**EU Digital Agenda**
- 2020 Headline indicators

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*Presentation of J.M. Barroso to the Informal European Council, 11 February 2010*

*Uni TRENTO / Crash course on Research funding*
An inclusive high-employment society

**JOBS**

**Key facts**
- Despite progress, only 2/3 of our working age population is employed (66%), compared to over 70% in the US and Japan.
- Only 46% of our older workers (55-64) are employed compared to over 62% in the US and Japan.

**SKILLS**

**Key facts**
- About 80 million people have low or basic skills, but lifelong learning benefits mostly the more educated.
- By 2020, 16 million more jobs will require high qualifications, while the demand for low skills will drop by 12 million jobs.

**FIGHTING POVERTY**

**Key facts**
- 80 million people were at risk of poverty in the EU prior to the crisis; 19 million are children; unemployed are particularly exposed.
- 8% of people in work don't earn enough to make it above the poverty threshold.

**An EU agenda for new skills and jobs**

- Empl. Rate = 75% (from 69%)
- Early School leavers 10% (from 15%)
- Lift 20 million out of poverty

EU Anti-poverty platform

Presentation of J.M. Barroso to the Informal European Council, 11 February 2010
### Green growth: a sustainable and competitive economy

<table>
<thead>
<tr>
<th>COMBATING CLIMATE CHANGE</th>
<th>ENERGY</th>
<th>COMPETITIVENESS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Key facts</strong></td>
<td><strong>Key facts</strong></td>
<td><strong>Key facts</strong></td>
</tr>
<tr>
<td>Achieving our goals means reducing emissions by twice as quickly in the next decade than in the last decade</td>
<td>Meeting our goals will result in €60 billion less in oil and gas imports by 2020</td>
<td>The market for green technologies is forecast to triple by 2030 / Improving resource efficiency by 20% would increase EU growth by around 1 per cent</td>
</tr>
<tr>
<td>Jobs in the eco-industry have increased by 7% every year since 2000; meeting our renewable target would mean 2.8 million jobs in the sector</td>
<td>Further progress with the internal market for energy can add 0.6% to 0.8% GDP</td>
<td>Using the single market to the full / improved market access and regulatory convergence can boost growth and jobs</td>
</tr>
</tbody>
</table>

**A Resource efficient Europe (20 / 20 / 20 plan)**

- Reduce green gas by 20% ('90)
- Increase renewable energy by 20%
- Reduce energy waste by 20%

**An Industrial Policy for the Globalisation Era**
SUSTAINABLE GROWTH

THE 6th TECHNOLOGICAL WAVE?

Can EU lead the “Great Transition”?

US/China lead the Nano-Info-Bio Wave

2. Growth and Innovation in the EU

2.1 CHALLENGES: THE EU INNOVATION SCOREBOARD
WHAT IS INNOVATION IN A KNOWLEDGE BASED ECONOMY?

- Old definition - Research gets to the market as a new (or improved) product or industrial (business) process
- "New" definition – Knowledge which reaches production, the market or the citizen

Innovation input indicators:
- *Innovation drivers* (5 indicators), measure the structural conditions required for innovation potential;
- *Knowledge creation* (4 indicators), measure the investments in R&D activities, key elements for a successful knowledge-based economy;
- *Innovation & entrepreneurship* (6 indicators), measure the efforts towards innovation at firm level.

Innovation output indicators:
- *Applications* (5 indicators), measure the performance as labour and business activities, and their value added in innovative sectors;
- *Intellectual property* (5 indicators), measure the achieved results in terms of successful know-how.
EU INNOVATION SCOREBOARD - 2

THE INNOVATION INDICATORS

◆ INPUT – INNOVATION DRIVERS
  1.1 S&E graduates per 1000 population aged 20-29
  1.2 Population with tertiary education/100 population aged 25-64
  1.3 Broadband penetration rate (broadband lines/100 population)
  1.4 Participation in life-long learning / 100 population aged 25-64
  1.5 Youth education attainment (% of 20-24 with upper secondary)

◆ INPUT – KNOWLEDGE CREATION
  2.1 Public R&D expenditures (% of GDP)
  2.2 Business R&D expenditures (% of GDP)
  2.3 Share of Medium high-tech and High-tech R&D (% of manufacturing R&D Expenses)
  2.4 Share of enterprises receiving public funding for innovation
EU INNOVATION SCOREBOARD - 3

THE INNOVATION INDICATORS

◆ INPUT – INNOVATION & ENTREPRENEURSHIP

3.1 SMEs innovating in-house (% of all SMEs)
3.2 Innovative SMEs co-operating with others (% of all SMEs)
3.3 Innovation expenditures (% of total turnover)
3.4 Early-stage venture capital (% of GDP)
3.5 ICT expenditures (% of GDP)
3.6 SMEs using organisational innovation (% of all SMEs)
EU INNOVATION SCOREBOARD - 4
THE INNOVATION INDICATORS

◆ OUTPUT – APPLICATIONS
  4.1 Employment in high-tech services (% of total workforce)
  4.2 Exports of high technology products as a share of total exports
  4.3 Sales of new-to-market products (% of total turnover)
  4.4 Sales of new-to-firm products (% of total turnover)
  4.5 Employment in medium-high and high-tech manufacturing (% of total workforce)

◆ OUTPUT – INTELLECTUAL PROPERTY
  5.1 EPO patents per million population
  5.2 USPTO patents per million population
  5.3 Triadic patent families per million population
  5.4 New community trademarks per million population
  5.5 New community designs per million population
The Innovation gap is getting smaller

Europe is lagging behind the US and Japan with regard to innovation drivers, knowledge creation and intellectual property.

For the remaining two innovation categories (i.e. innovation & entrepreneurship and applications) the available evidence does not allow to draw any firm conclusion.
EU INNOVATION SCOREBOARD - 6

ANALYSING EU-US INNOVATION GAP

<table>
<thead>
<tr>
<th>Category</th>
<th>EU- US gap</th>
</tr>
</thead>
<tbody>
<tr>
<td>USPTO patents</td>
<td>-49%</td>
</tr>
<tr>
<td>Tertiary education</td>
<td>-38%</td>
</tr>
<tr>
<td>Early-stage venture capital</td>
<td>-23%</td>
</tr>
<tr>
<td>Business R&amp;D</td>
<td>-15%</td>
</tr>
<tr>
<td>High-tech exports</td>
<td>-12%</td>
</tr>
<tr>
<td>Broadband penetration</td>
<td>-11%</td>
</tr>
<tr>
<td>Triad patents</td>
<td>-9%</td>
</tr>
<tr>
<td>ICT expenditures</td>
<td>-4%</td>
</tr>
<tr>
<td>Public R&amp;D</td>
<td>-2%</td>
</tr>
<tr>
<td>Med/high-tech R&amp;D</td>
<td>-2%</td>
</tr>
<tr>
<td>EPO patents</td>
<td>-1%</td>
</tr>
<tr>
<td>S&amp;E graduates</td>
<td>6%</td>
</tr>
<tr>
<td>Community trademarks</td>
<td>18%</td>
</tr>
<tr>
<td>Community designs</td>
<td>20%</td>
</tr>
<tr>
<td>Med/high-tech manuf. employ.</td>
<td>21%</td>
</tr>
</tbody>
</table>

"2006" vs "2002-2004"
EU INNOVATION SCOREBOARD - 7
THE EU LEADS THE WORLD in 4 AREAS

- New graduates in science & engineering (EU:13‰ > US : 10‰)
  - Much better education at graduate and undergraduate level (similar to Japan).

- In Europe and Japan, employment in manufacturing industries that produce medium/high and high-tech goods (7% of total) is twice than that in the US (4% of total).
  - Competitive strength but declining trend for all triad countries

- European trading companies (101 EC trademarks/million) lead US (34 trademarks) and Japan (only 12 trademarks).

- The number of Community designs is also very high in Europe (111 new designs per million population in 2005) with respect to US and Japan (18 and 13 new designs).
  - Competitive strength in design and trade mark innovation
EU INNOVATION SCOREBOARD - 8

THE EU TRAILS in 7 KEY AREAS

- Business expenditure in R&D (Jap. 2.4% of GDP, US 2%, EU 1.2%)
- ICT expenditure (Jap. 7.6% of GDP, US 6.7%, EU 6.4%)
- Broadband penetration rates (Jap. 16%, US 15%, EU 11%)
- Tertiary education (US 38%, Jap. 37%, EU 23%)
- Venture capital investments in early stage of company activity (US 0.072% of GDP, EU 0.023%, Jap. < 0.005%)
- Total exports of high-tech products (US: 26.8% of total, Japan 22.4%, EU 18.4%) - Rem: China is now leading in volume here!
- Number of patents granted: US and Japan lead in triadic patents, national patents and even slightly in EPO patents.
EU INNOVATION SCOREBOARD - 9
BUT THE EU PANORAMA IS VERY VARIED

Dotted lines show EU25 performance.
EU INNOVATION SCOREBOARD - 10

TRAILERS ARE CATCHING UP BUT REMAIN WEAK

“Leaders & followers”, dominate all 5 dimensions. “Trailing” focus on applications, “Catching-up” on innovation and entrepreneurship.
EU INNOVATION SCOREBOARD - 11
MORE RESEARCH IN SERVICES IS NEEDED

Figure 2.3.10 Share of BERD performed in the services sector (%)
“AHO REPORT” - 2006

Service sector and “hidden innovation”

◆ “Innovation is frequently found in the most unlikely places”:
  - New products, processes and services (Public research programmes do not address it: business and technology precede science!!)
  - New methods of production (mass customisation) or improving quality
  - Major technological improvements are not necessarily technology-based e.g. Distributed engineering at FIAT, 24hr round development at Inbev
  - New ways of handling a commodity commercially (e.g. liquified gas)
  - Opening of a new market (e.g. Cheap Glasses & GSM in India, eBay…)
  - Re-structuring of an industry (monopoly: Easyjet, Skype; Reactivity to market Zara…)

◆ Risk of supplying researchers & innovative services to the US!
  - From 150,000 to 400,000 EU researchers in the US
  - The EU paradox: EU researchers develop technologies exploited in US
  -> WWW developed at CERN (TBL)
  -> MP3 developed and patented by Fraunhofer Institute
  -> Skype developed in EU, sold to e-Bay (N.Zennström)
2. Growth and Innovation in the EU

2.1 ANALYSIS : THE INNOVATION UNION SCOREBOARD

2.2 RESPONSE : THE INNOVATION UNION(2010-2020)
Why Innovation Union?

- A cornerstone of Europe 2020 strategy
- Globalisation of knowledge production and innovation capacities
  - Develop world-class excellence
  - Attract investment through better support and framework conditions
  - Establish strategic cooperation with world partners

- Impact of the crisis on public and private finance, survival of innovative SMEs
- Major challenges to address with reduced means

Innovation emergency!
Globalisation of knowledge

Declining EU share of knowledge production

Evolution of World R&D expenditure in real terms, PPS€ at 2000 prices and exchange rates, 1995-2008

Figure Private Expenditure on R&D as % of GDP (1) - average annual growth (%) in the major economies, 2000-2007 (2)

Stagnating business R&D

Average annual growth as % of GDP, EU-27, US, Japan, South Korea & China, 2000-2007
Economic and financial crisis

- EU lost **six million jobs**, €1000 Bn annual GDP due to crisis

- **Invest in future growth**
  
  EU target of **3% of GDP for R&D** in 2020 could create a net **3.7 million jobs** and close to **€800 Bn annual GDP** by 2025

- **Make the most of available resources**
  
  through leverage effects, integration and cooperation
Societal challenges

- Climate change
- Health and ageing
- Use of natural resources
- Energy security
- Clean transport
- Land use
- ….

- Powerful drivers of change in economy and society
- Major global market opportunities
- Requiring EU-scale approaches
- From research to market

New needs → new ideas → new markets
What is Innovation Union?

- **Strategic approach**
- **Partnership** with Member States
- **Whole chain of innovation:** from blue sky to market

**Tackling weaknesses**
- Under-investment
- Fragmentation
- Framework conditions

**Building on strengths**
- Focus on societal challenges
- **Broad concept** of innovation
- Involving all actors

☞ A distinctive European approach to innovation
Innovation Union highlights

- European Innovation Partnerships
- European Research Area framework
- Streamlined EU programmes
- New financial instruments
- Reform of standardisation system
- Public procurement of innovation
- Social innovation pilot
- Stronger monitoring
Key measures of Innovation Union

1. Strengthening the knowledge base
   - Education and skills
   - European research area
   - EU financing instruments
1.1 Education and skills

◆ **Key issues**
- Europe needs at least one million more researchers
- Universities need reform and closer links with business to train top talents for innovation jobs

◆ **Key measure**
- Independent ranking system to benchmark universities (2011)
1.2 European Research Area

◆ Key issues

- **Fragmentation and overlaps** between national research and innovation systems
- **Huge complexity** of support system with myriad of funding schemes with different rules and timetables

◆ Key measure

- **European Research Area framework** (2012) to remove cross-border obstacles by 2014
- Including coherence of overall support system
1.3 EU funding instruments

◆ Key issues

- Too many instruments pursuing different objectives
- Complexity of access, particularly for SMEs

◆ Key measure

- Focus, streamlining and radical simplification of funding schemes by 2014
Key measures of Innovation Union

2. Getting good ideas to market
   - Access to finance
   - Single innovation market
   - Openness and creative potential
2.1 Access to finance

◆ Key issues
- Few European SMEs grow into major companies
- Lack of finance is a major cause
- Crisis made situation worse

◆ Key measure
- New generation of financial instruments with European Investment Bank (2014)
  - high leverage (15+)
  - addressing market gaps from venture capital to major innovation projects.
2.2 Single innovation market

◆ Key issues
- Lack of **EU Patent**: Council called to agree by end 2010
- Slow **standard setting**
- **Public procurement** (17% of GDP) not geared to innovative products and services

◆ Key measures
- **Reform standardisation system** (2011)
- **Support procurers to set budgets for innovation** (2011) Target at least €10 Bn
2.3 Openness and creative potential

◆ **Key issues**
- Growing importance of *open innovation*
- Dormant knowledge and intellectual property

◆ **Key measures**
- *Open access* to become default principle for publications from EU Research Framework Programme
- Develop *European knowledge market* (2011) based on national experiences (e.g. patent pools)
3. Social and territorial cohesion

◆ **Key issues**
- Avoid an « innovation divide »
- Make best use of **€ 86 Bn Structural Funds** earmarked for research and innovation until 2013

◆ **Key measures**
- Support Member States and regions to use Structural Funds with **smart specialisation strategies** (2011)
- **Social innovation** pilot programme (2011)
4. European Innovation Partnerships - 1

◆ Key issues

- Major **societal challenges** require **joint responses** across policies and across EU
- Numerous **sub-critical, uncoordinated initiatives**:  
  - between EU / Member States / Regions  
  - R&D / Market-side actions (public procurement, standards, regulation)

◆ **European Innovation Partnerships** are:

- Frameworks bringing together main actors and actions  
  - At EU and national levels  
  - From research to market  
  - Around common objectives and targets
4. European Innovation Partnerships - 2

2010-11
- Council, Parliament to discuss the concept
- Member States and stakeholders invited to join
- Preparation of pilot on active and healthy ageing
- Aim: two additional healthy life years by 2020

2012
- Others to follow pending discussions and building on experience with pilot
- Topics considered: smart cities, mobility, water, raw materials, agriculture
5. International cooperation

◆ Key issues
- Third countries see **27+1 small/medium parties, not one major partner**
- Europe’s **openness is not always reciprocated**
- **Global challenges** require a global response

◆ Key measures
- **Joint EU / national priorities** for cooperation with third countries (2012)
- Agree **international infrastructures** with world partners (2012)
Making the Innovation Union happen!

◆ A priority for EU Institutions
◆ European Council dedicated meeting in February 2011

◆ Accelerating national reforms
◆ Self assessments of R&I systems under Europe 2020

◆ Tracking progress
◆ EU target of 3% of GDP on R&D and national targets
◆ New indicator on fast-growing innovative firms
◆ New Scoreboard of 25 indicators
Get involved in the Innovation Union

- Innovation Union website
  - http://ec.europa.eu/research/innovation-union/

- Innovation Union Facebook page

- Innovation unlimited blog
THE INNOVATION UNION

EU’S FLAGSHIP INITIATIVE (PART of EUROPE 2020)
INTEGRATING RESEARCH and INNOVATION

Governance Level
- World
- Europe
- State
- Region
- Province
- City

KNOWLEDGE GENERATION
- e.g. Joint Programming Initiatives
  - Alzheimer
  - Agriculture & CC
  - Diet & Health
  - Cultural Heritage
  ...

Tax & Finance engineering

INNOVATION

Pre-commercial procurement

Regional Funds
 Intellectual Property

Research Development Applications Pilots Prototypes Social services Markets
3. Brainstorming

"Necessity is the mother of invention, it is true, but its father is creativity, and knowledge is the midwife."
- Jonathan Schattke, XXIst Century scientist

Nano-info bio vs. The great Transition, a Museum Europe or Europe as a Muse for a new Renaissance?