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# The future of Europe: Co-creation and sustainability

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#### Contents

#### The future of Europe

- > A challenging world
- EU under pressure
- Future of work

## **Co-creation and sustainability**

- An open and forward-looking European Union
- Progresses and risks in man-technology nexus
- European sustainable lifestyles



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Research and Innovation on SUSTAINABLE URBAN DYNAMICS World and European Energy and Environment Transition Outlook

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> European forward-looking activities: Building the future of "Innovation Union" and ERA





#### **Global Europe** 2050

European Union Research in Foresight









3

# THE FUTURE OF EUROPE

## A rich vocabulary

- Foresight
- Modelling
- Forecast
- Vision
- Horizon scanning

- > Trend monitoring
- Technology Assessment
- Roadmap
- Impact Assessment
- > Prospective

#### Voir loin et large, analyser en profondeur, prendre des risques, penser à l'homme

#### **Gaston Berger**

#### A CHALLENGING WORLD

#### Systemic changes in the last 50 years



#### The great acceleration (1900-2000)

- World population: from 1.5 to 7 billion people
- Real GDP: from 5 to 70 trillion \$
- Energy use: from 50 to 500 exajoule
- Loss of species: from 10% to 30%

#### From 20<sup>th</sup> to 21<sup>st</sup> century



#### From serial to personalized









#### **New business models**









Source: FEB, Airwolf, Metropole, airbnb

#### **Blurring boundaries**

- Professional and Private?
- Industry and Services?
- Market and State?
- North-South? East-West? Developed-developing?
- Neo-Keynesian, neo-liberal or State capitalism?
- > Multipolar world, G2, *The end of the West*?

#### **Economic outlook**

- Global growth flat-lined
- Global demand over-relying on pull from US economy
- China's growth deteriorating and rebalancing towards services (from manufacturing) with increased instability
- Slowdown in global trade growth; more volatile equity prices in stock markets
- More instability in emerging markets and vulnerabilities to exchange rate shocks
- Monetary policy (very low interest rates) not sufficient to support global demand

#### **ICT product exporters**



#### **Extreme wealth and poverty**



Source: São Paulo, picture from D. Bounds blog

#### The wealth of the 62 richest persons in the world is equivalent to the 3.5 billion poorest people



Sources: Wealth of the bottom 50 percent from Credit Suisse, 'Global Wealth Databook 2015'. Data on the net wealth of the richest 62 individuals from Forbes' annual list of billionaires.

#### Source: OXFAM, 2016

#### **Urbanisation**



## **Slums in urban population**

Ethiopia, Soudan and Bangladesh	More than 80%
Nigeria and Pakistan	More than 70%
Perou	More than 60%
India	More than 50%
Vietnam, Iran, Turkey	More than 40%
Egypt, China, Brazil, Argentina	More than 30%

#### **Migrations**

#### **Asylum seekers**

#### **Economic migrants**



Legal migrants vs. Irregular migrants

# Money transfer from migrants to DC: € 50 Billion in 2000 and 420 B in 2015 (ODA: € 150 B)

Source: Reuters and afrik.com, World Bank and CNCD

#### **Cosmopolitan cities**

Cities	% of foreign-born population
Dubai	83
Brussels	62
Toronto	46
Auckland, Sydney, Los Angeles	39
London	37



- Shift to a global multipolar economic system
- New actors incl. multinational enterprises, large cities, NGOs, sovereign wealth funds, academic institutions
- Global brands, migrations, global value chains
- Counter-effects from local and regional pride: local preferences for food, agriculture, entertainment and living styles

#### **Two visions of the future**





Source: W. Schultz, Infinite Futures

Source: J. Fernandez, MIT

#### **Uneven distribution of wealth**



Today: the richest 10% earns 10 times more than the poorest 10%

In the 80's: ratio of 7:1

23

#### **Global risks map**



#### Private sector loan debt in % of GDP



#### Vulnerability

Who?	To what?	Why?
The poor, informal workers socially excluded	Economic shocks, health shocks	Limited capabilities
Women, people with		
disabilities, migrants, minorities, children,	Natural disasters, climate change, industrial hazards	Location, position in society, sensitive periods in the life cycle
the elderly, youth		
Whole communities, regions	Conflict, civil unrest	Low social cohesion, unresponsive institutions, poor governance

#### **EU UNDER PRESSURE**

## **EU declining demographic power**

In the EU, while 5.1 million babies were born in 2015, 5.2 million persons died (i.e. the first negative natural change ever recorded by Eurostat)





#### **EU population age structure**



# 36 Million people in the EU will be aged more than 85 in 2060

Source: DG RTD and Eurostat

#### 29

#### **Government gross debt (% in GDP)**



Source: Eurostat, 2015

30

#### **Unemployment rate**



#### **Centers of innovation in the world**



Source: EU, ESPAS

#### EU gross value added (€ Billion)



Source: EC, DG RTD, FESSUD (W. Dymarski, R. Paes Mamede)

## **A** shrinking Europe

EU GDP	Population (in Million)	1950	2050
37% in 1970	India	372	1 700
28% in 2010	Africa	227	2 000
17% in 2050	EU 28	381	500

#### Il n'y a plus que des petits pays en Europe, mais certains ne le savent pas

#### **Paul-Henri Spaak**

# **A united Europe**



Source: Elisa Di Francisca, 2016

#### GDP per inhabitant (PPS, 2013)



Per capita income differs by 14 to 1 between the ten richest and the ten poorest regions of the EU

Source: EC, DG RTD, WWWforEurope (K. Aiginger)

#### Monthly minimum wages

EU Member States	€ per month
LU	1900
BE, DE, FR, NL, IE, UK	1350-1500
ES, SI	700-800
EL, PT	500-700
CZ, EE, HR, HU, PL, SK	300-400
BG, RO	150-250

Source: Eurostat, 2015

#### Inhabitant revenue in Belgium: Lasne € 39000 & Saint-Josse-Ten-Nood € 8000

Source: BE SPF-Economie, 2015

#### **Working life**





#### **Poverty and social exclusion**

20% of EU people at risk of poverty and social exclusion



#### **Institutions matter**

- Institutions and policies matter a lot: a person in the bottom 10% income has a 20% chance of college education against a 90% chance for a person in the top 10% income (US experience)
- Return of the patrimonial (wealth-based) society with a change in the rate of public vs. private capital in all industrialised countries
- Private capital represented around 20 to 30% of GDP in the 1950s, compared to around 700% in 2010 (the ratio of public capital to GDP has remained stable at 100%)



#### **Social inequalities and EU fairness**

- 5% of the households in the EU account for 37% of the total wealth, while a quarter of EU citizens are at risk of poverty
- One in five 15-year-olds in Europe is 'functionally illiterate or innumerate'
- The strongest determinant of educational success is social origin
- Many young people are trapped in unstable, low-paid and low-skilled jobs

#### **Expenditure on educational institutions (as % of GDP)**



#### Increasing inequality in half of EU MS



#### Resilience

- Financial regulation
- Climate change agreement
- Early childhood development
- Macroeconomic policies
- Natural disaster risk reduction
- Social cohesion

*Preventing shocks compositing capabilities frotecting choices* 

- Universal provision of education and health
- Full employment
- Promoting gender and group equality
- Responsive institutions
- Disaster preparedness

- Social protection
- Job creation
- Building social cohesion and competencies
- Tackling discrimination by changing laws and norms
- Crisis and conflict recovery

#### **FUTURE OF WORK**

#### *Le travail éloigne de nous trois grands maux: l'ennui, le vice et le besoin*

#### Voltaire

#### The second machine age

There's never been a better time to be a worker with special skills or the right education, because these people can use technology to create and capture value. However, there's never been a worse time to be a worker with only 'ordinary' skills and abilities to offer, because computers, robots and other digital technologies are acquiring these skills and abilities at an extraordinary rate



## Youth unemployment

	2012	2013	2014
EU-28	23.3	23.7	22.2
Euro area	23.5	24.4	23.8
Belgium	19.8	23.7	23.2
Bulgaria	28.1	28.4	23.8
Czech Republic	19.5	18.9	15.9
Denmark	14.1	13.0	12.6
Germany	8.0	7.8	7.7
Estonia	20.9	18.7	15.0
Ireland	30.4	26.8	23.9
Greece	55.3	58.3	52.4
Spain	52.9	55.5	53.2
France	24.4	24.8	24.1
Croatia	42.1	50.0	45.5
Italy	35.3	40.0	42.7
Cyprus	27.7	38.9	35.9
Latvia	28.5	23.2	19.6
Lithuania	26.7	21.9	19.3
Luxembourg	18.0	16.9	21.2
Hungary	28.2	26.6	20.4
Malta	14.1	13.0	11.8

#### More than 20% youth unemployment

Netherlands	11.7	13.2	12.7
Austria	9.4	9.7	10.3
Poland	26.5	27.3	23.9
Portugal	38.0	38.1	34.7
Romania	22.6	23.7	24.0
Slovenia	20.6	21.6	20.2
Slovakia	34.0	33.7	29.7
Finland	19.0	19.9	20.5
Sweden	23.7	23.6	22.9
United Kingdom	21.2	20.7	16.9
lceland	13.6	10.7	10.0
Norway	8.6	9.1	7.9
Switzerland	:	:	:
Turkey	15.8	17.1	18.0
United States	16.2	15.5	13.4
Japan	8.1	6.8	6.3

And almost 15 M of NEETS Young Europeans Not in Employment, Education or Training 49

#### % of EU firms reporting difficulties finding staff with required skills



#### Labour productivity annual growth



## Why are there still so many jobs?

- During the past 200 y. of automation & technological progress, human labour was not made obsolete
- Although employment polarisation is observed and many middle-skill jobs are susceptible to automation, many middle-skill jobs will continue to demand a unique combination of routine and non-routine tasks
- Non-routine tasks include interpersonal interaction, flexibility, creativity and problem solving skills where workers have a comparative advantage
- Education systems should focus on human capital investments that produce skills that are complemented by technological change

#### Literacies, skills and competences

COMPETENCES	MINDSET & TALENT	
Critical thinking Creativity Communication Collaboration <b>DOMAI</b> Area	Curiosity Initiative Persistence Empathy Adaptability	
CORE LITERACIES		
Reading and writing Numeracy Scientific literacy	<ul> <li>ICT fluency</li> <li>Language skills (mothertongue +1)</li> <li>Cultural and civic awareness</li> </ul>	

#### **Overcoming barriers to innovation**

- Work environment and organizational culture (cf. risk averse, hierarchy, engagement) are key drivers of innovation in any organisation
- Informal networks, "shadow structures" sharing knowledge, collaborating and connecting to the external world are instrumental in making change happen in the organisation
- Developing a learning culture is key to innovation

#### **Future of work**



Globalisation, digitalization and virtualisation will make work even more portable and detached from geography

Source: S.L. Dolan, ESADE, 2015

#### **Jobs at risk**

- Automation may lead to a net loss of more than 5 million jobs across 15 major advanced economies
- Where tasks are routine, automation is likely
- Sectors at risk: low-skill manufacturing jobs, but also some craft and clerical occupations
- Trend towards more service-oriented economies
- Job growth in the future in the service sector and in non-routine elementary occupations such as personal care services

#### **Global Europe**



For every E1 billion we get in exports, 14,000 extra jobs are created across the EU

### Labour force by level of qualification in the EU



Source: Cedefop, Future Skills Supply and Demand in Europe Forecast 2012

#### Perspectives for the young generation

- Millennials are keen to have more diversity and more flexibility in their work patterns and commitments
- They are reinventing the essence of economic exchange, professional fulfilment and consumption itself through the collaborative economy and a growing army of 'prosumers', with products and services being delivered on-demand and just-in-time
- As for more mature workers, especially highly skilled, they are less and less interested in retirement and prefer to stay in the work force for longer, albeit with flexible arrangements

#### Industrial employment (2003-2013)

	% change
Canada	- 23%
France	- 22%
UK	- 17%
Italy	- 15%
USA	- 12%
Japan	- 11%
Germany	- 1%

#### **Research and innovation quality**



## (R)evolution

- Fechnological revolution alters the way we live, work, and relate to one another
- The fusion of technologies is blurring the lines between the physical, digital, and biological spheres
- Difference with third industrial revolution: velocity (speed of current breakthroughs), scope (disrupting almost every industry in every country), and systems impact (transformation of entire production, management, and governance system)
- Billions of people connected by mobile devices, with unprecedented processing power, storage capacity, and (unlimited) access to knowledge

## (R)evolution

- These possibilities are multiplied by emerging technology breakthroughs in fields such as artificial intelligence, robotics, the Internet of Things, autonomous vehicles, 3-D printing, nanotechnology, biotechnology, materials science, energy storage, and quantum computing
- Great promises: empower the economically excluded of the world by access to digital networks; increase of organisations efficiency; accelerate the development of personalised drugs; technological solutions to CC
- Great potential perils: unequal division of technological advances, disruption of labour markets, threat of unemployment; erosion of global governance; potential abuse of robotics, genetic engineering and cyber weapons; disruption of many established businesses

Source: K. Schwab, 2016

#### **CO-CREATION AND SUSTAINABILITY**



# Encouraging creativity and collaboration between various actors



#### **Environmental crisis**

- > Biodiversity
- Climate change
- Soil erosion and deforestation
- Water acidification and salinization
- Insecticides and pesticides
- Particulates in the air
- Foxic chemical waste, heavy metals,...