

Demographics | Globalization &
Future Markets | Scarcity of
Resources | Climate Change |
Technology | Knowledge Society |
Global Responsibility

About the TREND COMPENDIUM 2030

WHAT IS IT?

- > The TREND COMPENDIUM 2030 is a global trend study compiled by Roland Berger Strategy Consultants
- > It describes seven megatrends that will shape the world over the next 20 years
- > All trends have a broad impact on how we do business – Therefore, Roland Berger experts have identified corporate actions that companies must take today
- > The study also takes a look at how we will live in 2030

OUR APPROACH

- > We first screened all relevant trend, scenario and future studies worldwide
- > Then we verified, analyzed and consolidated the results, using them to define seven megatrends
- > We next broke down the seven megatrends into 21 subrends, looking at each from a global perspective and the viewpoints of industrialized and developing countries
- > Finally, we identified corporate actions that companies worldwide should consider taking today

USE IT!

- > Following the executive summary and an introduction in chapters A and B, chapter C presents all trends and corporate actions in detail, while chapter D gives you an idea of life in 2030
- > In addition, every chapter presents the most important sources, organizations and indicators to help you keep track of the changes in the world as well as dig deeper into the trends presented

CONTENT OF THE TREND COMPENDIUM 2030

A.

EXECUTIVE SUMMARY:

At a glance

B.

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Thinking about the future

C.

TRENDS 2010-2030:

Seven global megatrends and recommended corporate actions

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OUTLOOK:

Life in 2030

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A. EXECUTIVE SUMMARY
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A. EXECUTIVE SUMMARY

Seven global megatrends shape the face of the world in 2030

T1 CHANGING DEMOGRAPHICS

T2 GLOBALIZATION & FUTURE MARKETS

T3 SCARCITY OF RESOURCES

T4 THE CHALLENGE OF CLIMATE CHANGE

T5 DYNAMIC TECHNOLOGY & INNOVATION

T6 GLOBAL KNOWLEDGE SOCIETY

T7 SHARING GLOBAL RESPONSIBILITY

SUBTRENDS

GROWING WORLD POPULATION



8.3 billion people will live on earth

AGING SOCIETIES



Median age will increase by 5 years to 34 years

INCREASING URBANIZATION



59% of the world's population will live in cities

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T7 SHARING GLOBAL RESPONSIBILITY

SUBTRENDS

ONGOING
GLOBALIZATION



Exports and FDI will
grow faster than
GDP

BRIC: THE NEW
POWERHOUSES

BRIC

Their GDP will grow
by 7.9% p.a.

BEYOND BRIC

Next 11

The Next Eleven
will grow by 5.9%
p.a. – Strong
growth for ASEAN 5

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T7 SHARING GLOBAL RESPONSIBILITY

SUBTRENDS

ENERGY



Global primary energy consumption will increase 26%

WATER



Half the world's population will be living in areas of high water stress

OTHER COMMODITIES



Some rare metals will run out –
Rising food demand

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SUBTRENDS

INCREASING CO₂ EMISSIONS



World CO₂ emissions will increase 16%

GLOBAL WARMING



The average global temperature will rise 0.5-1.5°C

ECOSYSTEM AT RISK



Declining biodiversity and extreme weather

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T7 SHARING GLOBAL RESPONSIBILITY

SUBTRENDS

TECHNOLOGY DIFFUSION



Technology will spread at high speed throughout the world

POWER OF INNOVATION



Innovations will change our lives – Robotics, Internet of things

THE AGE OF LIFE SCIENCES



Challenged by demographics, boosted by R&D

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T7 SHARING GLOBAL RESPONSIBILITY

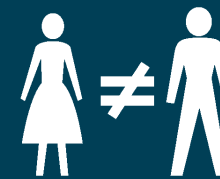
SUBTRENDS

KNOW-HOW BASE



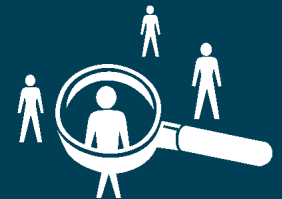
55% of the people worldwide will have completed at least secondary education

GENDER GAP



Differences between men and women expected to narrow

WAR FOR TALENT



The demand for qualified people exceeds the supply

A. EXECUTIVE SUMMARY

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T7 SHARING GLOBAL RESPONSIBILITY

SUBTRENDS

SHIFT TO GLOBAL COOPERATION



Nations will share more responsibility

GROWING POWER OF NGOs



Number of NGOs will grow significantly

INCREASING PHILANTHROPY



More donations, but philosophy of giving will change

A. EXECUTIVE SUMMARY

Corporate Actions

T1 CHANGING DEMOGRAPHICS

Focus on growth regions
Adapt to the 60+ age group
Use cities as trend labs; smart solutions are needed

T2 GLOBALIZATION & FUTURE MARKETS

Focus on foreign markets
Exploit the market potential of the middle class
Apply scenario techniques

T3 SCARCITY OF RESOURCES

Reduce consumption
Reduce dependency
Appeal to consumers

T4 THE CHALLENGE OF CLIMATE CHANGE

Seize new business opportunities
Reduce CO₂ emissions
Manage climate risk

T5 DYNAMIC TECHNOLOGY & INNOVATION

Establish cooperative partnerships & networking
Watch the latest technology trends
Think divergently & convergently

T6 GLOBAL KNOWLEDGE SOCIETY

Establish efficient knowledge management
Make the working environment attractive to women
Improve your global hiring strategy

T7 SHARING GLOBAL RESPONSIBILITY

Use business opportunities resulting from global cooperation
Establish an ethical management approach
Optimize cooperation with the nonprofit sector

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B. INTRODUCTION

There are different ideas about the development of the world



LINEAR

- > Darwin: Survival of the fittest
- > Knowledge, experience, etc. which are based on what previously existed and therefore steadily follow a linear trend of the past



STEPWISE

- > Marxism: Socio-economic conflicts have historically manifested themselves as distinct stages: 1. Primitive communism -> 2. Slave -> 3. Feudalism -> 4. Capitalism -> 5. Socialism -> 6. Communism
- > Hegel: Thesis, antithesis, synthesis



IN WAVES

- > Kondratiev: Long waves (S-shaped, technology-driven cycles of modern capitalism that last decades)
- > Business cycles: Economic ups and downs, labor markets, interest rates, stock markets



CIRCULAR

- > Religious beliefs of reincarnation
- > The eradication of existing epidemics and illnesses (e.g. plague, smallpox) and the appearance of new ones (e.g. HIV, swine flu)



STIMULUS-DRIVEN

- > Shifts in direction after single events: Environmental awareness after Chernobyl, focus on security after 9/11
- > Creationism



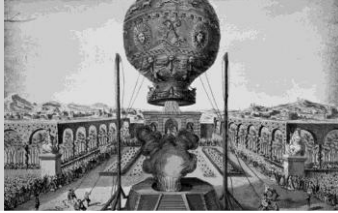
CHAOTIC

- > No structure that humans can identify at first sight
- > Chaos theory analyzes chaotic developments

B. INTRODUCTION

What certain "visionaries" have said about the future (1)

CREATIVITY



"Everything that can be invented has been invented."

Charles Duell, US patent office, 1899

MUSIC



"We don't like their sound, and guitar music is on the way out."

Decca Recording Co. rejecting the Beatles, 1962

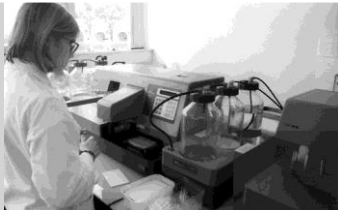
TRANSPORT



"Heavier-than-air flying machines are impossible."

Lord Kelvin, President of the Royal Society, 1895

HEALTH



"That virus is a pussycat."

Peter Duesberg, molecular biology professor at U.C. Berkeley, on HIV, 1988

EQUALITY



"If anything remains more or less unchanged, it will be the role of women."

David Riesman, conservative American social scientist, 1967

B. INTRODUCTION

What certain "visionaries" have said about the future (2)

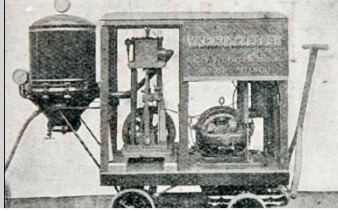
POLITICS



"Democracy will be dead by 1950."

John Langdon-Davies, British author, 1936

TECHNOLOGY



"Nuclear-powered vacuum cleaners will probably be a reality in 10 years."

Alex Lewyt, president of vacuum cleaner company Lewyt Corp., 1955

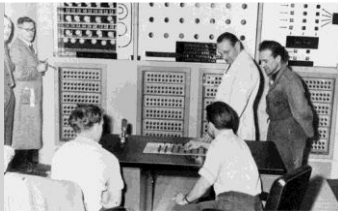
MEDIA



"Who the hell wants to hear actors talk?"

H.M. Warner, co-founder of Warner Brothers, 1927

IT



"I think there is a world market for maybe five computers."

Chairman of IBM, 1943

COMMUNICATION



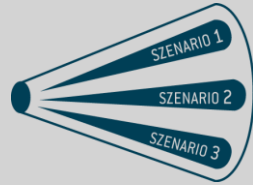
"The telephone has too many shortcomings to be seriously considered as a means of communication."

Western Union internal memo, 1876

B. INTRODUCTION

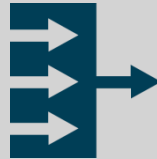
The future can also be predicted professionally – Selected methods for predicting the future

1. SCENARIO PLANNING



- > It helps design and analyze **several plausible future states**, according to alternative conditions
- > Experts usually draw up **extreme scenarios** (best case, worst case) or relevant/typical scenarios

2. SIMULATION



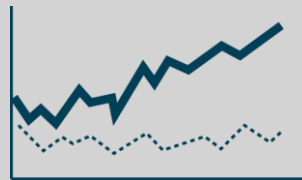
- > **Imitation of some real thing**, state of affairs, or process via simplifying approximations and assumptions
- > It can be used to show real effects of **alternative conditions** and courses of action

3. FUTUROLOGY



- > Futurology is the study of **postulating possible (P), probable (P), and preferable (P) futures** via quantitative and qualitative data
- > **Wildcards (W)** are being used to include low probability but high impact events

4. PREDICTION MARKETS



- > Prediction markets are **virtual market places** where people trade shares of persons/events/outcomes
- > They are run to gather and aggregate information that are scattered among a group

5. EXTRAPOLATION



- > Extrapolation is the **simplest** and therefore often used method
- > Future development is predicted by **extrapolating the past** development (known data points) **into the future**

B. INTRODUCTION

What can we learn from all this?

No right or wrong –
Unforeseeable events
play an important role



As there are different methodologies to professionally predict the future they can lead to different results. Wildcards consider improbable events

Predicting the
future is difficult



The future is not a linear extrapolation of the past. The world can develop in many different directions

Even the brightest minds
can be completely wrong



Having a decade of experience in a field or being a Nobel prize laureate doesn't make your predictions right

Technological inventions
can change everything



The way we live, communicate, think...

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C. OVERVIEW

Seven global megatrends shape the face of the world in 2030

T1 CHANGING DEMOGRAPHICS

GROWING WORLD POPULATION
AGING SOCIETIES
INCREASING URBANIZATION

T2 GLOBALIZATION & FUTURE MARKETS

ONGOING GLOBALIZATION
BRIC: THE NEW POWERHOUSES
BEYOND BRIC

T3 SCARCITY OF RESOURCES

ENERGY
WATER
OTHER COMMODITIES

T4 THE CHALLENGE OF CLIMATE CHANGE

INCREASING CO₂ EMISSIONS
GLOBAL WARMING
ECOSYSTEM AT RISK

T5 DYNAMIC TECHNOLOGY & INNOVATION

TECHNOLOGY DIFFUSION
POWER OF INNOVATION
THE AGE OF LIFE SCIENCES

T6 GLOBAL KNOWLEDGE SOCIETY

KNOW-HOW BASE
GENDER GAP
WAR FOR TALENT

T7 SHARING GLOBAL RESPONSIBILITY

SHIFT TO GLOBAL COOPERATION
GROWING POWER OF NGOs
INCREASING PHILANTHROPY

TREND COMPENDIUM 2030



T1 CHANGING DEMOGRAPHICS



T1 CHANGING DEMOGRAPHICS

The main trends for the next 20 years are a growing and aging population that moves into the cities

GROWING WORLD POPULATION



1. WORLD

8.3 billion people will live on earth (today: 6.9 billion). Growth will be 20% but slowing down compared to the last 20 years

2. DEVELOPED

Population will grow by 3.6% from 1.2 billion to 1.3 billion people

3. DEVELOPING

Population will grow by 24%, so seven times faster than in the developed countries, from 5.7 billion people to 7.0 billion

AGING SOCIETIES



1. WORLD

Aging will accelerate due to rising life expectancy. Median age will increase by 5.1 years to 34 years

2. DEVELOPED

Median age will increase by 4.4 years to 44 years

3. DEVELOPING

Median age will increase by 5.5 years to 32 years

INCREASING URBANIZATION



1. WORLD

Urbanization will continue. 59% of the world's population will live in cities

2. DEVELOPED

Share of urban population will increase by 5.7 percentage points to 81%

3. DEVELOPING

Share of urban population will increase by 9.9 percentage points to 55%

CORPORATE ACTION

1. FOCUS ON GROWTH REGIONS

Concentrate on regions with both strong population and GDP per capita growth, such as China and India

2. ADAPT TO THE 60+ AGE GROUP

Products, services and working conditions must be adapted to their needs

3. USE TREND LABS & SMART SOLUTIONS

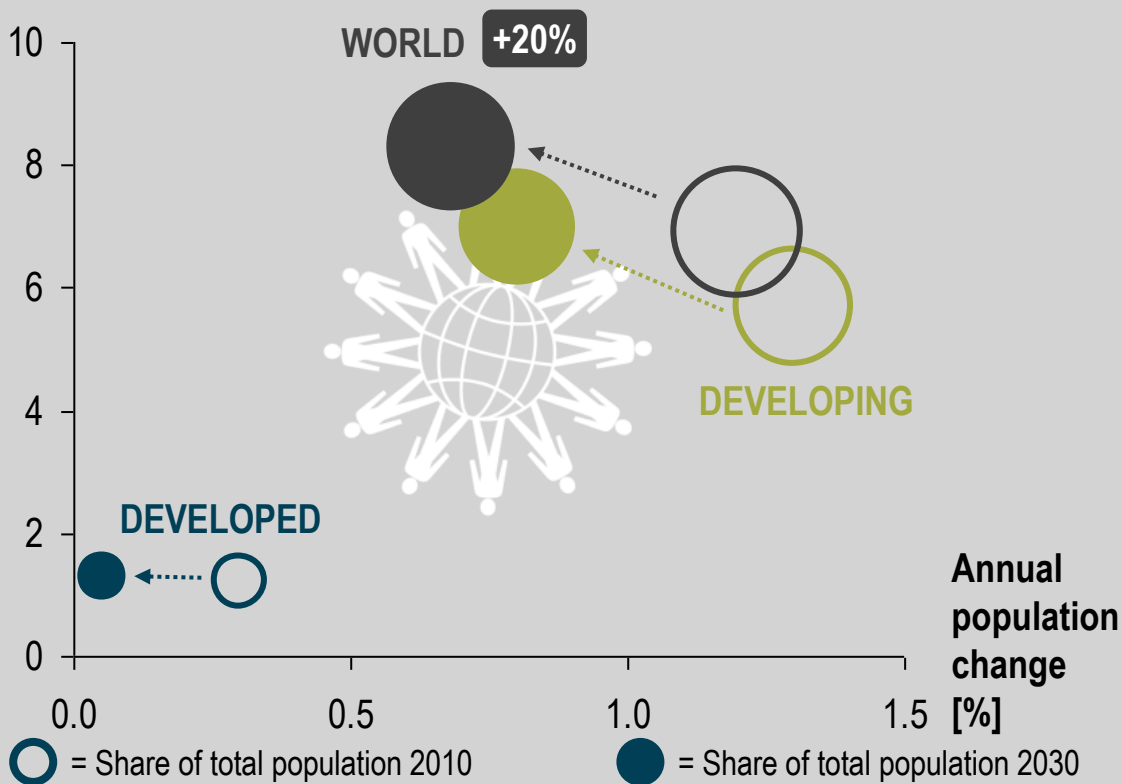
Cities should be used to spot future consumer trends. Smart solutions are needed for limited space

The terms "developed" and "developing" are based on the IMF definition and the data sources used throughout the whole document

T1.1 POPULATION

World population will grow to over 8 billion people – But the growth rate will slow down steadily

Total population [bn]



Source: UNPD; World Bank

1. WORLD

- > Over the next 20 years, **the world population will balloon to 8.3 billion, up 20%** (0.9% or 1.4 billion people p.a.) from 6.9 billion today. In 1990, the world population was 5.3...

2. DEVELOPED VS. DEVELOPING COUNTRIES

- > The **developing countries** will grow nearly **seven times faster** than the developed countries. As a result, they will increase their share of the global population from 82% today to 85%...

T1.1 POPULATION

Text behind animated chart

1. WORLD

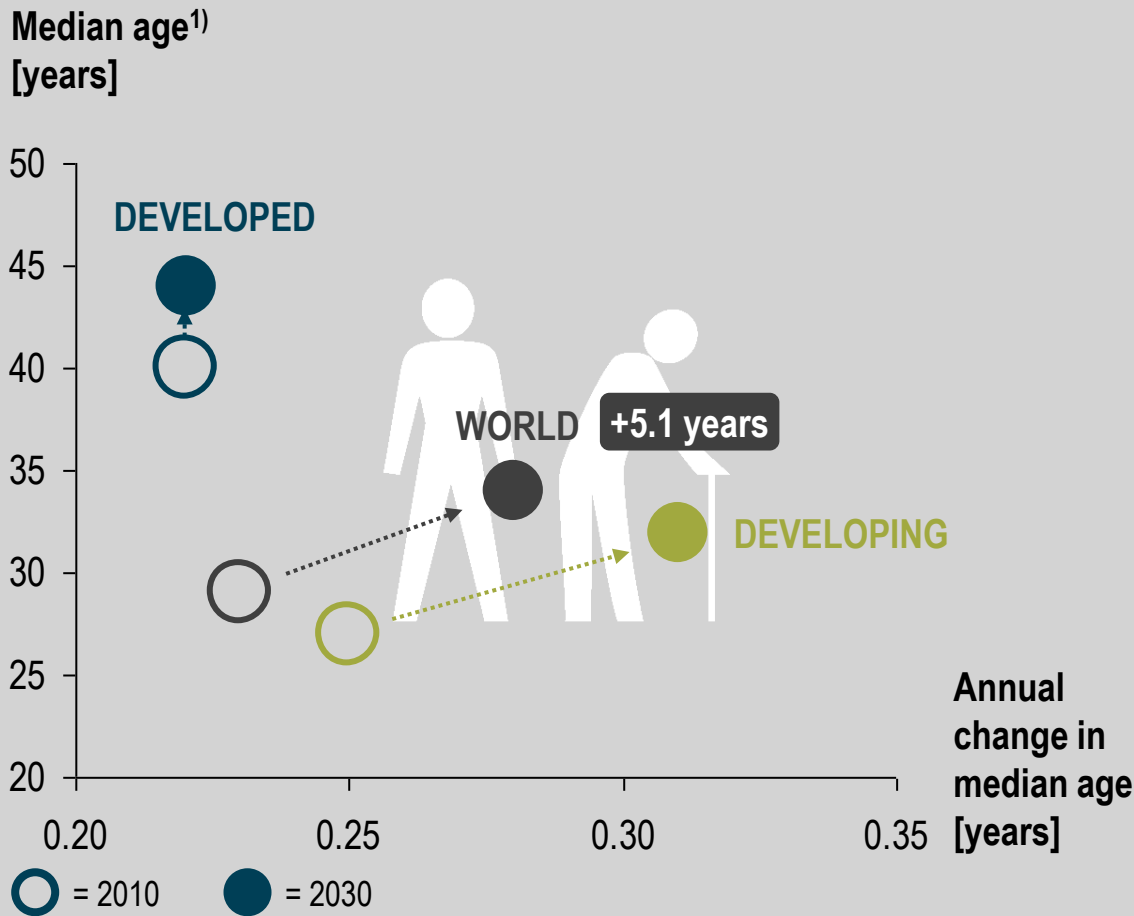
- > Over the next 20 years, **the world population will balloon by 1.4 billion people to 8.3 billion, up 20%** (0.9% or 70 million people p.a.) from 6.9 billion today. In 1990, the world population was 5.3 billion
- > Yet compared to the population growth of the past 20 years, **growth is slowing down in both absolute and relative terms.** Between 1990 and 2010, the population grew by 31% (1.3% p.a.) or 1.6 billion people

2. DEVELOPED VS. DEVELOPING COUNTRIES

- > The **developing countries** will grow nearly **seven times faster** than the developed countries. As a result, they will increase their share of the global population from 82% today to 85% in 2030. Between 1990 and 2010, the developing countries grew "only" five times faster than the developed countries (37% vs. 7.8%)
- > The population of **developed countries** will **grow by 3.6%** between 2010 and 2030, from over 1.2 billion to nearly 1.3 billion people (another 44 million people). The average **annual growth rate** for the next 20 years will be 0.2% (2.2 million people) and therefore half the rate of the past 20 years (0.4% p.a.)
- > The **developing countries** will **grow 24%** between 2010 and 2030, from a population of 5.7 billion to 7.0 billion. That increase alone (1.4 billion people) equals the total size of the developed countries in 2030. The average annual growth rate will be 1.1%, or 68 million people (more than the size of France or the UK today) and therefore slowing down compared to the last 20 years (1.6% p.a.)

T1.2 AGING

The global population will become 5.1 years older, with the median age moving up to 34 years



1) Median age is the population midpoint: 50% of the population is younger and 50% is older
Source: UNPD; World Bank

1. WORLD

- > Since life expectancy will continue to increase, the **median age will rise** and aging of population will even **accelerate**. Globally, the median age will **move up by 5.1 years**, from 29...

2. DEVELOPED VS. DEVELOPING COUNTRIES

- > Measured in median age, the people in the **developed countries will be 12 years older** than the people in the developing countries in 2030. However, the gap will **narrow**, since...

T1.2 AGING

Text behind animated chart

1. WORLD

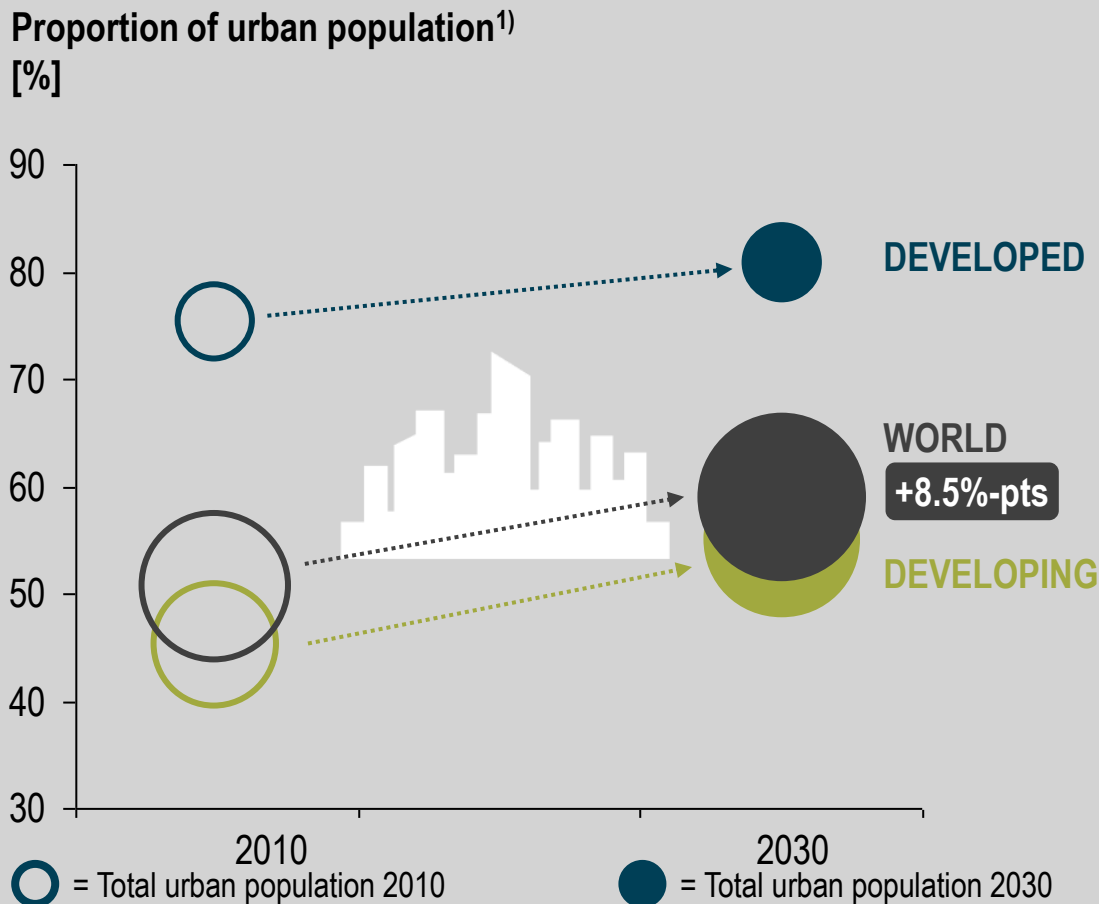
- > Since life expectancy will continue to increase, the **median age will rise and aging of population will even accelerate**. Globally, the median age will **move up by 5.1 years**, from 29 today to 34 in 2030. Between 1990 and 2010, the increase was 4.7 years, up from 24 in 1990

2. DEVELOPED VS. DEVELOPING COUNTRIES

- > Measured in median age, the people in the **developed countries will be 12 years older** than the people in the developing countries in 2030. However, **the gap will narrow**, since the developing countries are aging faster than the developed countries. In 1990 and today the gap was 13 years. The median age in the developing countries in 2030 corresponds with the level of the developed countries in 1985
- > The median age in the **developed countries will rise by 4.4 years, reaching 44 years** by 2030. Aging of population will slow down compared to the last 20 years. In 1990, the median age was 35 years
- > The median age in the **developing countries will rise by 5.5 years, reaching 32 years** by 2030. Aging of population will slightly speed up compared to the last 20 years. In 1990, the median age was 22 years

T1.3 URBANIZATION

As urbanization continues, 80% of people in developed countries and 55% in developing ones will live in cities



1) Urban population is defined primarily as inhabitants in localities of a certain minimum size. This minimum size ranges between 200 inhabitants (e.g. Denmark) and 10,000 (e.g. UK). The definitions used are generally those of national statistical offices
Source: UNPD; World Bank; UNFPA

1. WORLD

- > The **urban** share of the population will **continue to rise at high speed** (8.5 percentage points) and growth will **even accelerate** compared to the last 20 years (7.8 percentage points). By...

2. DEVELOPED VS. DEVELOPING COUNTRIES

- > The **developed countries** will still have a **far higher share of urban population** than the developing countries in 2030. However, the gap **narrows** from 30 percentage points in 2010...

T1.3 URBANIZATION

Text behind animated chart (1/1)

1. WORLD

- > **The urban** share of the population will **continue to rise at high speed** (8.5 percentage points) and growth will **even accelerate** compared to the last 20 years (7.8 percentage points). By 2030, 4.9 billion people, or 59% of the world's population, will live in cities, starting from 3.5 billion today (50% of the world's population). This means an increase of 40% in absolute numbers. In 1990, only 43% of the population lived in urban areas

2. DEVELOPED VS. DEVELOPING COUNTRIES

- > The **developed countries** will still have **a far larger share of urban population** than the developing countries in 2030. However, the gap **narrows** by 2030, as the urbanization process is more pronounced in the developing countries
- > The **developed countries** will **increase** their share of urban population by **5.7 percentage points**, from 75% **today to 81% in 2030**. The urbanization process will slightly speed up compared to the last 20 years, as the increase between 1990 and 2010 was only 4.4 percentage points
- > Over 90% of the increase in urbanization is taking place in **developing countries**. They will increase their share of urban population **by 9.9 percentage points** from 45% today to **55% in 2030**. Their speed of urbanization will stay relatively stable compared to the last 20 years (10.3 percentage points)

T1 CORPORATE ACTIONS (1)

Focus on growth regions

1. FOCUS ON GROWTH REGIONS

- > As many of the developed countries face a shrinking population, companies in those countries have limited potential to grow by acquiring new customers. Therefore, they need to **focus on countries with both a growing population and a growing income per capita**
- > Countries that will increase their population by more than 20 million people within the next 20 years and reach a per capita GDP above USD 10,000 in PPP will be **India, China, Nigeria, Indonesia, Brazil, Philippines, Egypt and Mexico** (in descending order according to total population growth)

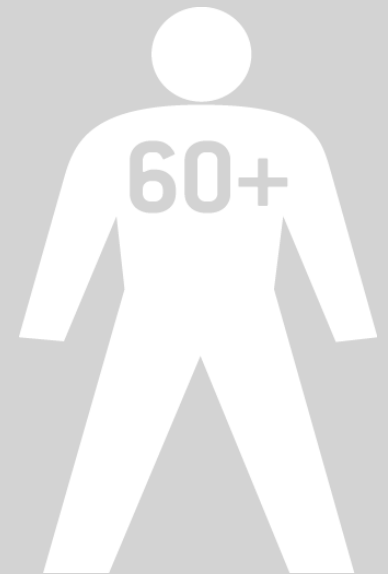


T1 CORPORATE ACTIONS (2)

Adapt to the 60+ age group

2. ADAPT TO THE 60+ AGE GROUP

- > Due to rising life expectancy and declining birth rates, global median age is rising. **In many developed countries, people aged 60 and over** will become the **largest segment**. In 2030, 29% of people in the developed countries will be older than 60, compared to 22% today
- > Companies need to focus on the people in this segment by **understanding their needs**. They are very consumption-driven, enjoy service and appreciate easy-to-use products. They do not want products branded for elderly people but still enjoy certain features addressing the **three S's: simplicity, service and safety**
- > A 60-year-old in 2030 will be more fit and healthier than one today, and therefore will look for different products. **Consumption patterns will be defined by life expectancy** or years left to live. A 70-year-old will be planning his next car purchase and a 60-year-old will still think about building her own home
- > As more of the working population will belong to the over-60 age group, it is also important to **adapt organizational structures and processes** to fully exploit their experience



T1 CORPORATE ACTIONS (3)

Use cities as the future trend laboratories and find smart solutions

3. USE CITIES AS THE FUTURE TREND LABORATORIES AND FIND SMART SOLUTIONS

- > As urbanization continues, cities will become more and more important for companies. Companies can use **cities as future trend laboratories**, since the main impulses and changes will come from them. The **Masdar City** in Abu Dhabi, for example, is a pilot project of a city that will rely entirely on renewable energy sources with a zero-carbon, zero-waste ecology
- > Both the population growth and the urbanization process will lead to decreased living space. Therefore, product development should focus on **smart solutions within limited space**. One challenge will be to find solutions to the paradox of providing more flexibility, more nature and more recreation within a constantly shrinking space
- > As consumers move into cities, **their demands change**. They will ask for more convenience, greater choices, faster solutions and more services. These demands need to be monitored and analyzed to turn them into market potential
- > Smart solutions are also needed for the new **megacities** in the developing countries; they need to rapidly establish an **appropriate infrastructure** and reduce the growth of slums. As the richest and the poorest of a country will be living side by side, the demand for **security systems** is likely to rise



T1 FOR FURTHER INFORMATION (1)

Most important indicators



POPULATION



> Total population [people]

> GROWTH

> Absolute growth [people]

> (Annual) population change [%]

AGING



> (Annual) change in median age [years]

> AGE

> Median age [years]

URBANIZATION



> Proportion of urban population to total population [%]

> Absolute number of people living in urban areas [people]

> GROWTH

> (Annual) change in urban population [percentage points]

T1 FOR FURTHER INFORMATION (2)

Most important sources and institutions



MOST IMPORTANT SOURCES

- > **UNPD:** World Population Prospects
- > **UNFPA:** State of World Population
- > **Berlin Institute for Population and Development:**
Online-Handbook Demography, Europe's Demographic Future
- > **World Bank:** Global Economic Prospect

KEY INSTITUTIONS

- > **UNPD:** United Nations Department of Economic and Social Affairs – Population Division
- > **UNFPA:** United Nations Population Fund
- > **OECD:** Organisation for Economic Co-operation and Development
- > **ICPD:** International Conference on Population and Development
- > **RAND Labor and Population**
- > **Berlin Institute for Population and Development**
- > **World Bank**



T2 GLOBALIZATION & FUTURE MARKETS

BRIC

Next 11

T2 GLOBALIZATION & FUTURE MARKETS

Today's most powerful emerging markets will have become the new economic superpowers

ONGOING GLOBALIZATION



1. WORLD

Globalization will continue, with real exports growing faster than real GDP (5.3% p.a. vs. 4.0% p.a.)

2. DEVELOPED

Real GDP is expected to rise by 1.8% per annum – These countries will account for only 27% of global nominal exports

3. DEVELOPING

Real GDP will rise by 6.7% per annum – These countries will account for 73% of global nominal exports

BRIC: THE NEW POWERHOUSES



1. ECONOMIC GROWTH

Real GDP in the BRIC countries will grow by 7.9% p.a. and exports by 7.8% p.a.

2. MARKET CAPITALIZATION

BRIC's equity market cap could rise by 10.6% p.a. to USD 59 trillion

3. MIDDLE CLASS

The middle class in the BRIC countries will grow by 150% to 2.0 billion people

BEYOND BRIC



1. ECONOMIC GROWTH

The real GDP of the Next Eleven will grow by 5.9%

2. MARKET CAPITALIZATION

The equity market cap of the Next Eleven will increase by 7.3% p.a.

3. MIDDLE CLASS

The Next Eleven's middle class will grow by 116% to 730 million people

CORPORATE ACTION

1. FOCUS ON FOREIGN MARKETS

Focus on growth regions and balance your country portfolio

2. EXPLOIT MARKET POTENTIAL OF MIDDLE CLASS

Understand and address the needs of the emerging middle class

3. APPLY SCENARIO TECHNIQUES

Use the opportunities of scenario planning and prepare for an uncertain future

T2.1 GLOBALIZATION

Globalization will continue, with world exports' share of GDP on the rise

World exports as share of GDP [%]



Source: IMF; Goldman Sachs; Standard Chartered Bank; EIU; World Bank; Roland Berger

1. WORLD

- > Globalization will continue, with exports and FDI growing faster than GDP. **The world's real GDP will grow by 4.0% p.a.** to around USD 135 trillion by 2030, up from...

2. DEVELOPED VS. DEVELOPING COUNTRIES

- > Because the real **GDP of the developing countries will grow nearly four times faster than** that of the developed countries, the latter will lose GDP share. As the real...

T2.1 GLOBALIZATION

Text behind animated chart (1/2)

1. WORLD

- > Globalization will continue, with exports and FDI growing faster than GDP. The **world's real GDP will grow by 4.0% p.a.** to around USD 135 trillion by 2030, up from USD 62 trillion today. GDP growth will slow down compared to the past 20 years, when the increase was 5.3% p.a.
- > Through 2030, **real exports will grow by 5.3% p.a.** to USD 45 trillion. However, like GDP, that growth is slowing down compared to the past 20 years. As exports grow faster than GDP, economies will continue to become more closely integrated. In 2030, exports will account for 33% of GDP, compared **to 26% today and 17% in 1990**
- > The strongest indicator for **continuing globalization** is **FDI growth above the GDP growth rate**. However, there is no long-term forecast for FDI flows for the period up to 2030. In the short run (i.e. by 2014), global FDI flows are expected to grow four times faster than world GDP. Even though the speed of FDI growth prior to 2030 is uncertain, it is very likely that it will be faster than the world's GDP growth. Emerging countries such as China and India will eventually catch up to the developed countries by 2030, attracting a large amount of FDI as well as investing in foreign markets themselves

T2.1 GLOBALIZATION

Text behind animated chart (2/2)

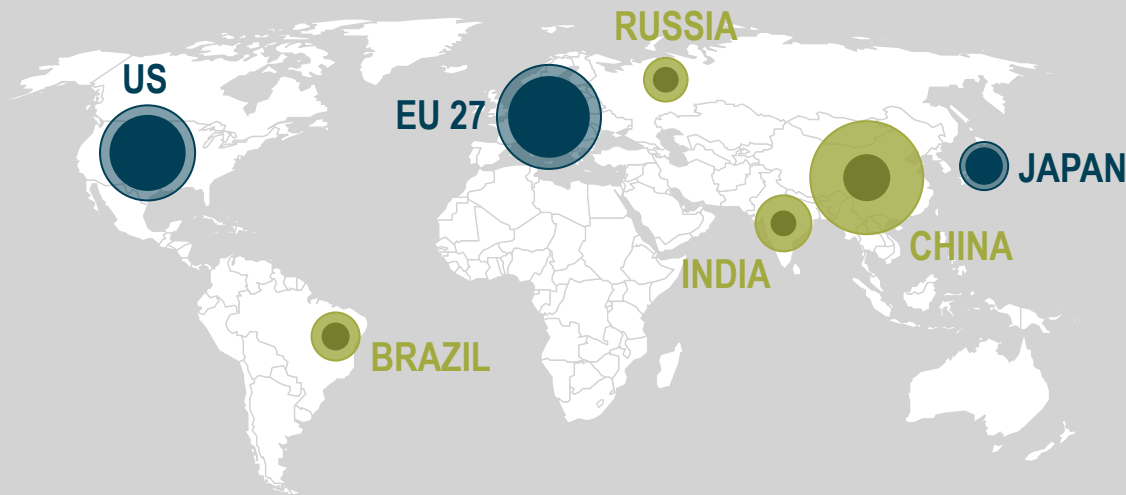
2. DEVELOPED VS. DEVELOPING COUNTRIES

- > Because the real **GDP of the developing countries will grow nearly four times faster than** that of the developed countries, the latter will lose GDP share. As the real **exports of the developing countries will also rise nearly twice as fast** as those of developed countries, the integration of their national economies into the international economy will accelerate. Asia is expected to overtake the EU as export leader in 2023 with a world export share of 30%. Concerning FDI flows, the developing countries will get more and more attention in the run-up to 2030
- > In the **developed countries, real GDP is expected to rise by 1.8% p.a.** to USD 59 trillion in 2030, **slowing down** compared to the past 20 years (4.3% p.a.). Therefore, developed countries' share of global GDP will decline sharply, from 66% today to around 44% in 2030. Their nominal exports will grow by 5.9% p.a. over the next 20 years, slowing down compared to the past 20 years. In 2030, they will **account for only 27% of global nominal exports**, compared to 47% today. The trade corridor between Europe and the United States will be only number 6 worldwide in 2030, responsible for 5% of interregional trade, down from 9% today. **FDI** flows to the developed countries are expected to increase, but **their share will decrease compared to the developing countries**. In 1990, they still accounted for 83% of global FDI, going down to 51% in 2009 and likely to decline even further by 2030
- > **Real GDP in the developing countries is expected to rise by 6.7% p.a.** to USD 76 trillion (56% of world's GDP) over the next 20 years, **slowing down slightly** compared to the past 20 years (8.0%). Their nominal exports will grow by 11% p.a., also representing a slowdown compared to the past 20 years. In 2030, developing countries will **account for 73% of global nominal exports**, compared to 53% today. China will lead the two major trade corridors of the world with Europe (11% of interregional trade) and other parts of Asia (10% of interregional trade) in 2030. Regarding FDI, the developing countries will claim a **rising share of received FDI inflow** up through 2030, as the new economic powerhouses will call for more investment

T2.2 BRIC

They will be the new economic powerhouses – Impressive economic size in 2030

Real GDP proportions in 2010 and 2030



● = Real GDP 2010

● = Real GDP 2030

Source: Goldman Sachs; EIU; IMF; MIGA; World Bank; Roland Berger

1. ECONOMIC GROWTH

- > The economic growth of the BRIC countries up through 2030 is overwhelming. Their **real GDP will grow by 7.9% p.a.** over the next 20 years, much faster...

2. MARKET CAPITALIZATION

- > The emerging equity markets will grow significantly by 9.3% p.a. to USD 80 trillion by 2030, while global equity market capitalization (in fixed 2010 USD) will increase...

3. MIDDLE CLASS

- > The purchasing power of billions of people in the BRIC markets will rise considerably by 2030. Using Goldman Sachs's definition of the middle class (annual income between...

T2.2 BRIC

Text behind animated chart (1/3)

1. ECONOMIC GROWTH

- > The economic growth of the BRIC countries up through 2030 is overwhelming. Their **real GDP will grow by 7.9% p.a.** over the next 20 years, much faster than over the past 20 years (5.6%). The BRIC countries will generate 36% of global GDP in 2030, compared to 18% today. **China's** annual real GDP growth rate will be the strongest at 9.0%, followed by **India** (8.4%), **Brazil** (5.5%) and **Russia** (5.3%). China will overtake the United States to become the world's largest economy by 2026. India's will be one-quarter the size of the Chinese economy in 2030, accounting for 5.7% of the world's GDP. Brazil will overtake Japan in 2030
- > **Real exports of the BRIC countries will increase at the same rate as their GDP at 7.8% p.a.** – i.e. faster than the average for the developing countries (6.7% p.a.), but slower than over the last 20 years (10% p.a.). The BRIC countries' share of global exports in 2030 (23%) will be almost on a par with that of Europe. Today it is only 14%, up from 5.8% in 1990. China and India will become the dominant global suppliers of manufactured goods and services, Brazil and Russia of raw materials. India's real exports will grow the fastest at 13% p.a. up to 2030, followed by China (7.1%), Brazil (6.5%) and Russia (4.9%). China will generate 14% of the world's exports in 2030, India 6.4%
- > All the **BRIC countries** will still be **among the world's most attractive locations for FDI** in 2030, due to their prospects for economic growth and wealth in resources. The strongest FDI growth rates are expected for India, followed by Brazil, Russia and China. The reason for China's slower growth is the strong basis it already has today (9% of world FDI). As India catches up to China, it will receive around 70% of China's FDI inflows as early as 2014

T2.2 BRIC

Text behind animated chart (2/3)

2. MARKET CAPITALIZATION

- > The emerging equity markets will grow significantly by 9.3% p.a. to USD 80 trillion by 2030, while global equity market capitalization (in fixed 2010 USD) will increase by 6.2% p.a. from USD 43 trillion to USD 145 trillion in 2030. The **BRIC's equity market cap could rise by 10.6% p.a.**, from USD 7.9 trillion to USD 59 trillion in 2030. This would take their share of global equity market cap from 18% today to 41% in 2030. China's share of global equity market cap is likely to rise from 11% today to 28% in 2030. This would **make China the largest single equity market in the world**, followed by the United States (23%). India's share of global equity market cap will be 5.4% in 2030, followed by Russia (3.7%) and Brazil (3.1%)

T2.2 BRIC

Text behind animated chart (3/3)

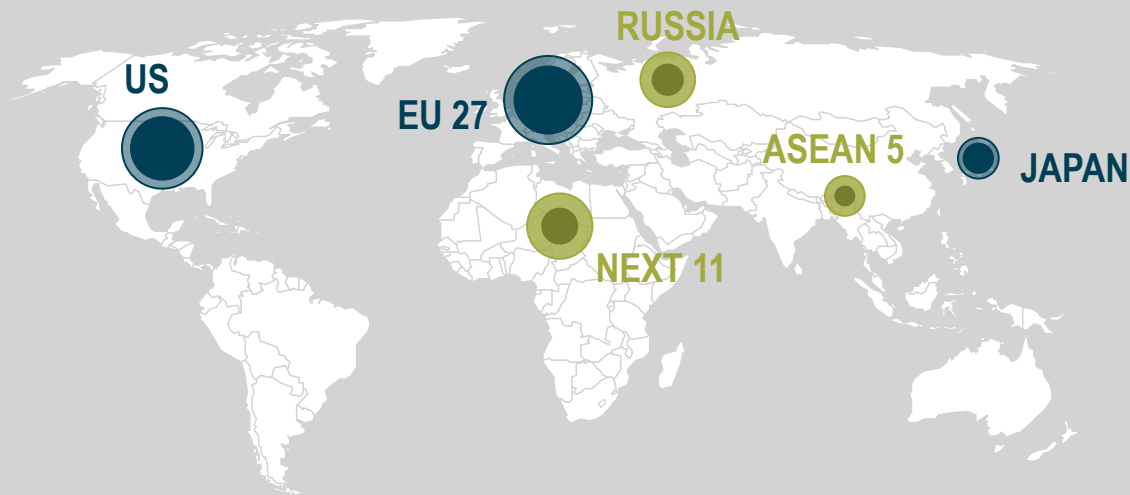
3. MIDDLE CLASS

- > The purchasing power of billions of people in the BRIC markets will rise considerably by 2030. Using Goldman Sachs's definition of the middle class (annual income between USD 6,000 and USD 30,000 in PPP terms), the **middle class in the BRIC countries will grow 150%**, from 0.8 billion people today to **2.0 billion in 2030**. China's middle class will peak around 2025 at 75% of the country's population, compared to 40% today, and nearly double to 1.1 billion people in 2025. In India, 57% of the population (850 million people) will belong to the middle class in 2030, compared to 7.1% today. Brazil's middle class will rise from 47% today to 58% (127 million people) in 2030. By contrast, Russia's middle class will decline from 71% today to 45% in 2030, but this will be due to people moving up to a higher income category
- > The BRICs will bring another **200 million** people with an annual income **over USD 15,000** into the world's economy by 2025 – the equivalent of the combined population of Germany, France and the United Kingdom. Therefore increasing demand will not be restricted to basic goods but will also affect **higher priced goods**
- > Despite the attention being given to the growing middle class, the **bottom of the income pyramid** should not be neglected. **Market share and brand reputation are there for the taking** by exploiting the high demand for targeted products. Hindustan Unilever Ltd. quickly became the market leader in India's rural shampoo market with a shampoo that works best with cold water and is sold in affordable small packages. Another example is a cooker from BSH Home Appliances (Bosch Siemens), developed for people at the bottom of the pyramid, which enables them to cook meals using regional vegetable oil. It makes energy use more efficient and reduces the risk of injuries caused by open fires or kerosene

T2.3 BEYOND BRIC

Countries "beyond" BRIC are the next economic tigers – Strong GDP growth up through 2030

Real GDP proportions in 2010 and 2030



● = Real GDP 2010

○ = Real GDP 2030

Source: Goldman Sachs; IMF; EIU; World Bank; Roland Berger

1. ECONOMIC GROWTH

- > There are other countries besides BRIC that are capturing the world's interest because of their promising economic future, specifically the **Next Eleven**¹⁾ and the...

2. MARKET CAPITALIZATION

- > The **biggest African economy** in 2030, South Africa (with a GDP of USD 1 trillion), will be only one-third the size of the biggest Next Eleven country in 2030, Mexico. The second...

3. MIDDLE CLASS

- > The **middle class in the Next Eleven** countries will **grow by about 120% up to 2030**. Goldman Sachs estimates that 730 million people in the Next Eleven countries...

T2.3 BEYOND BRIC

Text behind animated chart (1/4)

1. ECONOMIC GROWTH

- > There are other countries besides BRIC that are capturing the world's interest because of their promising economic future, specifically the **Next Eleven**¹⁾ and the **ASEAN Five**²⁾. We also look at the most economically attractive countries in **Africa** and **South America** in this section
- > The **Next Eleven will have a real GDP growth rate of 5.9%** p.a. over the next 20 years. By 2030, the combined real GDP of these countries will equal 30% of the BRIC's GDP and account for 11% of the world's GDP. In terms of real GDP (in USD trillion), the largest economies among the Next Eleven in 2030 will be Mexico (3.0), Indonesia (2.5), Turkey (2.2) and South Korea (2.1). **Real exports of the Next Eleven will rise 6.9%** – more slowly than over the last 20 years (8.1% p.a.), but faster than the world average. Therefore, the Next Eleven's share of global exports will rise to 12% by 2030, compared to 9.2% today and only 5.6% in 1990. The strongest overall increase in real exports between 2010 and 2030 will be in South Korea, Mexico and Turkey
- > The real GDP of the **ASEAN Five** will grow by 6.6% p.a., reaching about 4.0% of global GDP in 2030. The largest economies will be Indonesia and Thailand, the fastest-growing one the Philippines (7.5% p.a.). **Real exports by the ASEAN Five will grow by 6.4% p.a.**, down on the last 20 years (7.5%). In 2030, they will account for 4.9% of the world's exports, compared to 3.9% today. The strongest export growth will be in Vietnam (9.0%) and Thailand (6.6%)

1) Next Eleven: Bangladesh, Egypt, Indonesia, Iran, Mexico, Nigeria, Pakistan, Philippines, South Korea, Turkey, Vietnam

2) ASEAN Five: Indonesia, Malaysia, Philippines, Thailand, Vietnam

T2.3 BEYOND BRIC

Text behind animated chart (2/4)

1. ECONOMIC GROWTH

- > The **biggest African economy** in 2030, South Africa (with a GDP of USD 1.0 trillion), will be only one-third the size of the biggest Next Eleven country in 2030, Mexico. The second and third largest African economies, Nigeria and Egypt, are among the Next Eleven countries, due to their size and strong real GDP growth rates (7.0% p.a. for Nigeria, 8.2% p.a. for Egypt). Angola is the only large African economy that will grow even faster than Egypt, with a growth rate of 10.5% p.a.. Africa will **strongly increase its share of world exports** from 2.8% today to 7.1% in 2030. The strongest real export growth will be in Egypt (8.3% p.a.) and Algeria (5.9% p.a.)
- > Not counting Brazil (as examined in T2.2), **Argentina** will be the largest economy in South America in 2030, but still equaling just **one-fifth of the GDP of Brazil**. Columbia, Chile and Venezuela are the next to follow in terms of GDP in 2030. Of the larger economies in South America, the only country that is expected to grow even faster than Brazil is Chile (6.2% in real GDP growth p.a.). **Real export growth** over the next 20 years will be strongest in Chile (6.3% p.a.) and Peru (5.4% p.a.). All of Latin America will slightly increase its share of world exports from 5.6% today to 6.2% in 2030

T2.3 BEYOND BRIC

Text behind animated chart (3/4)

2. MARKET CAPITALIZATION

- > Goldman Sachs states that the **equity market capitalization of the Next Eleven will increase by 7.3%** p.a., from USD 2.1 trillion to USD 8.4 trillion in 2030 – i.e. 3.3 percentage points more slowly than in the BRIC countries. Their share of the world's equity market cap will go up by one percentage point to 5.8% in 2030. Of the five Next Eleven countries listed in the report¹⁾, South Korea will reach the highest equity market cap: USD 2.5 trillion in 2030, followed by Mexico (1.4) and Indonesia (1.3)
- > The equity market capitalization of the **ASEAN Five** (excluding Vietnam²⁾) will increase by 6.7% p.a. to USD 3.5 trillion. Their share of the world's equity market cap will go up from 2.2% today to 2.4% in 2030. After Indonesia, Malaysia will reach the highest equity market cap with USD 1.0 trillion in 2030
- > South Africa is expected to reach the highest equity market cap of all **African countries** by 2030. Its equity market cap is likely to grow by 6.5% p.a. to USD 2.3 trillion in 2030, about the size of the strongest Next Eleven country, South Korea

1) South Korea, Mexico, Turkey, Indonesia, Philippines

2) Not included in the Goldman Sachs report on equity market capitalization

T2.3 BEYOND BRIC

Text behind animated chart (4/4)

3. MIDDLE CLASS

- > The **middle class in the Next Eleven** countries will **grow by about 120% up to 2030**. Goldman Sachs estimates that **730 million people** in the Next Eleven countries will belong to the middle class in 2030, accounting for 20% of the global middle class. In absolute numbers (millions), the biggest middle-class groups in 2030 will live in Indonesia (178), Egypt (92) and Pakistan (76), and the highest percentage of people belonging to the middle class within a country in 2030 will be in Egypt (83%) and Indonesia (66%)
- > Even **excluding China and India, Asia** will experience the strongest absolute increase in its middle class by 2030 with an annual growth rate of 4.2%. About 330 million new people will enter the middle class within the next 20 years, from 260 million people today to **590 million in 2030** (16% of the global middle class)
- > **Africa** has the smallest share of the global middle class today. However, its growth is predicted to last the longest, with its peak expected much later than 2030. Its middle class will grow by more than 110 million people over the next 20 years, from 55 million today to **180 million in 2030** (5% of the global middle class)
- > Growth of the middle class in **Latin America** is already at its peak today and will steadily slow down as we approach 2030 with people moving to higher income brackets. Within the next 20 years, the Latin American middle class will grow by 50 million people, from 300 million today to **350 million in 2030** (10% of the global middle class)

T2 CORPORATE ACTIONS (1)

Focus on foreign markets

1. FOCUS ON FOREIGN MARKETS

- > Due to the strong economic growth in many developing countries, their **demand for international brands is rising fast**. Companies should take advantage of this by focusing on those markets via exports or building up subsidiaries
- > **Investments** (e.g. in marketing & sales, R&D and human capital) **need to be intensified in foreign markets**, especially in growth markets such as China, India and the Next Eleven
- > A **balanced country portfolio** is needed in order to benefit from the new emerging markets. It is crucial to find the right balance between established markets, growing markets and countries with an uncertain but promising future, e.g. Vietnam, Indonesia, Iran or Nigeria
- > Besides their auspicious economic prospects, these countries also **entail certain risks**, such as political instability. The countries mentioned rank quite low on the International Finance Corporation's (World Bank Group) ease-of-doing-business indicator: between 78 and 137 out of 183 (in descending order: Vietnam, Indonesia, Iran, Nigeria). Companies therefore need to **consider, analyze and evaluate political, social and cultural aspects** in addition to external economic developments to make sure they enter the right markets



T2 CORPORATE ACTIONS (2)

Market potential of the middle class

2. MARKET POTENTIAL OF THE MIDDLE CLASS

- > The middle class is often called the **engine of economic growth and consumption**. Companies should therefore **focus on countries with a growing middle class**. It is clear that the strongest growth up to 2030 will be in **Asia**
- > The special **needs of the middle class within a country or culture must be understood** in order to satisfy them successfully. Although some consumer patterns of the middle class will be the same from country to country (e.g. demand for status symbols), others will differ greatly (e.g. food consumption)
- > The new entrants into the middle class are hungry for **well-known international brands** and **status symbols** such as cars, mobile phones and many other products. The **demand for services**, e.g. financial services, will also increase with rising income
- > Companies need to benefit from this rising standard of living by **underlining the new status**. They also need to take account of **changing purchasing patterns**

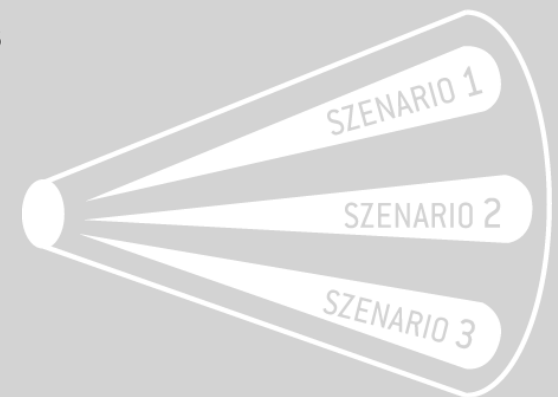


T2 CORPORATE ACTIONS (3)

Scenario techniques

3. SCENARIO TECHNIQUES

- > As the development of a globalized world does not follow a linear trend that can be easily extrapolated, and the **future cannot be predicted with great accuracy**, scenario techniques are becoming more and more important
- > Selecting the most appropriate scenario gives companies great advantages over competitors with no scenario planning, since it enables them to **react quickly, objectively and rationally**. This will be key in a fast-moving world. Scenarios for market entry or expansion can be planned and calculated according to different criteria such as GDP growth, FDI and so on
- > Besides analyzing opportunities, scenario techniques can also be used to **reduce risks**. As regional events quickly attain international relevance in a globalized world, it becomes increasingly difficult to predict economic downturns. Because most globalized companies will be affected by e.g. an international crisis, it is a **question of who is best prepared and who recovers most**. It will be about acting fast and taking the right action. **Early indicators** for each scenario therefore need to be defined and analyzed to identify the future scenario as quickly as possible and take the right action



T2 FOR FURTHER INFORMATION (1)

Most important indicators



GDP



- > (Annual) growth rate [%]
- > Economic power [GDP in USD]
- > Share of world GDP [%]

EXPORTS



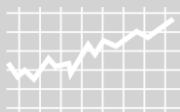
- > (Annual) growth rate [%]
- > Total exports [USD]
- > Share of world exports [%]

FDI



- > (Annual) growth rate [%]
- > Total FDI [USD]
- > Most attractive destination for FDI [ranking]

EQUITY MARKET CAPITALIZATION



- > (Annual) growth rate [%]
- > Size of equity market [USD]
- > Share of world equity market capitalization [%]

MIDDLE CLASS



- > People with an income between USD 6,000 and USD 30,000 in PPP terms [people; %]
- > Absolute and relative change of middle class [people; %]

EASE OF DOING BUSINESS



- > Country ranking [ranking – x out of 183]

T2 FOR FURTHER INFORMATION (2)

Most important sources and institutions



MOST IMPORTANT SOURCES

- > **EIU:** Economic Intelligence Unit – Database
- > **IMF:** World Economic Outlook
- > **The World Bank:** Global Economic Prospect
- > **UNCTAD:** World Investment Prospects Survey
- > **Goldman Sachs:** Global Economics Paper no. 170; No. 204; The Power of the Purse
- > **IFC:** Ranking – Ease of Doing Business
- > **MIGA:** Multilateral Investment Guarantee Agency – Survey
- > **Standard Chartered Bank:** The Super-Cycle Report

KEY INSTITUTIONS

- > **EIU:** Economic Intelligence Unit
- > **IMF:** International Monetary Fund
- > **The World Bank**
- > **UNCTAD:** United Nations Conference on Trade and Development
- > **IFC:** International Finance Corporation (World Bank Group)
- > **Rockefeller Foundation**
- > **UIA:** Union of International Association

T3 SCARCITY OF RESOURCES



T3 SCARCITY OF RESOURCES

Energy, water and other commodities will be scarce by 2030 – Intelligent solutions needed

ENERGY



1. WORLD

Global primary energy consumption will increase 26%

2. DEVELOPED

Their energy consumption will increase slightly (2.6%), their share of global energy consumption will fall to 36%

3. DEVELOPING

Their consumption will grow by 45%, their share of global energy consumption will rise to 64%

WATER



1. WORLD

Total annual water demand will increase 53%, and half the world's population will be living in areas of high water stress

2. DEVELOPED

Their total demand for water will increase 40% but their share will decrease from 27% of the world's total to 24%

3. DEVELOPING

Water withdrawals are predicted to increase 58%. Agriculture accounts for the biggest share, at 82%

OTHER COMMODITIES



1. WORLD

Some rare metals will run out. World demand for food will rise significantly

2. DEVELOPED

Dependency on imported raw materials will increase. The EU has named 14 raw materials as being especially critical

3. DEVELOPING

Industries in the resource-rich developing countries will be at a competitive advantage

CORPORATE ACTION

1. REDUCE CONSUMPTION

Use "resource-gentle" technologies and cut water pollution

2. REDUCE DEPENDENCY

Use substitute resources, integrate backward and hedge resource prices

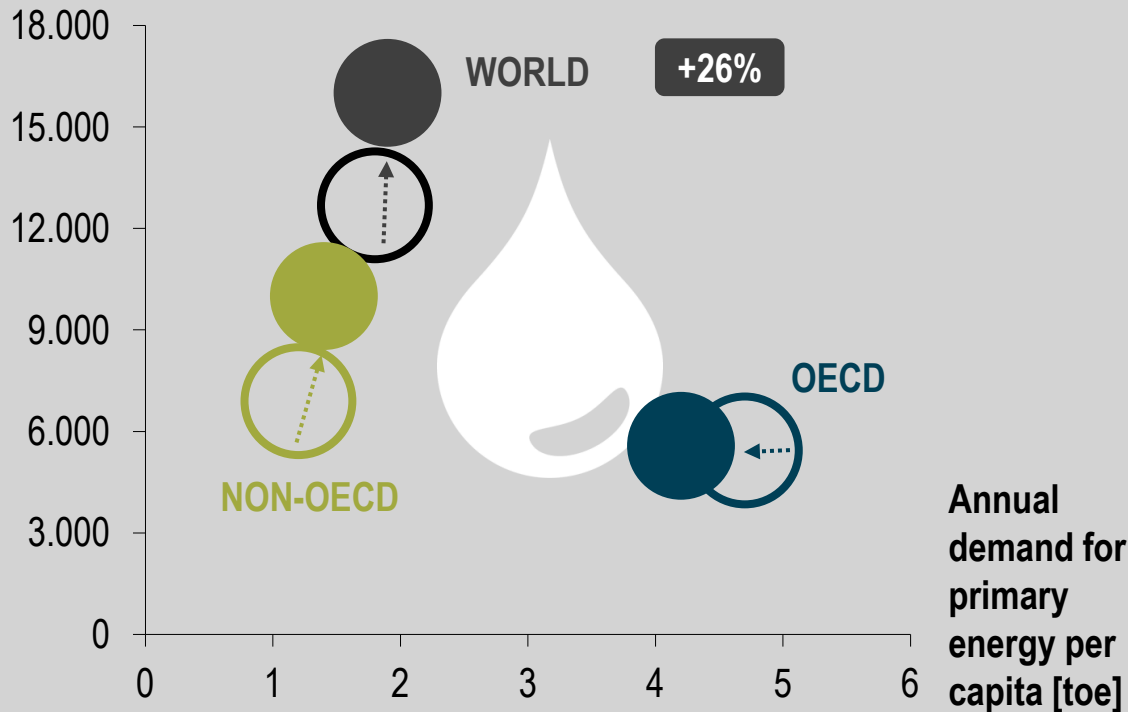
3. APPEAL TO CONSUMERS

Address consumers via resource-saving products, communication and an image of responsibility

T3.1 ENERGY

Global primary energy demand will increase 26% – Mainly due to non-OECD countries

Total annual demand for primary energy [Mtoe]



○ = 2010 ● = 2030

toe = Tonnes of oil equivalent

Source: IEA; EIA; IEE; Shell; World Coal Institute; BP

1. WORLD

- > Both **total demand for energy** and **energy prices will rise** up to 2030. **Oil will remain the most important resource**, but will lose some significance to renewables. At ...

2. DEVELOPED VS. DEVELOPING COUNTRIES

- > The **gap in energy consumption between the developed and developing countries will widen**, with the developing countries consuming 79% more energy than...

T3.1 ENERGY

Text behind animated chart (1/2)

1. WORLD

- > Both **total demand for energy** and **energy prices will rise up to 2030**. **Oil will remain the most important resource**, but will lose some significance to renewables. At current rates of production, the remaining lifetime of the various energy sources will be longest for coal (119 years), followed by gas (63 years) and oil (46 years). Conflicts over energy supplies are likely to rise, since these resources are highly concentrated in a small number of countries
- > **According to the IEA New Policies Scenario¹⁾, total demand for primary energy** will increase by 26% (1.2% p.a.) to 16,014 million tonnes of oil equivalent (Mtoe) by 2030
- > **Demand for all energy resources will grow up to 2030**, but the **proportions will shift**. Liquid fuels will provide 31% of the world's energy in 2030, down from 35% today and 38% in 1990. Number two in 2030 will be coal at 27%, slightly higher than in previous years – 26% today and 25% in 1990, followed by natural gas with 23% in 2030, the same figure as today. The fastest growing resources over the next 20 years will be renewables (2.8% p.a.), rising from a share of 10% today to 13% in 2030, followed by nuclear (2.3% p.a.). Nuclear energy will increase its share from 5.5% today to 6.4% in 2030
- > The **prices of oil and most other forms of energy are expected to rise** over the next 20 years, but predictions vary. The annual energy outlook of the US Energy Information Administration (EIA) for 2010 quotes an oil price of USD 124 per barrel for its reference case in 2030, and as much as USD 204 for its high-price case. Gas and coal prices are expected to follow this trend. Government subsidies will continue to determine the price levels of many renewables

1) The New Policies Scenario is the medium variant. For detailed assumptions, see definitions

T3.1 ENERGY

Text behind animated chart (2/2)

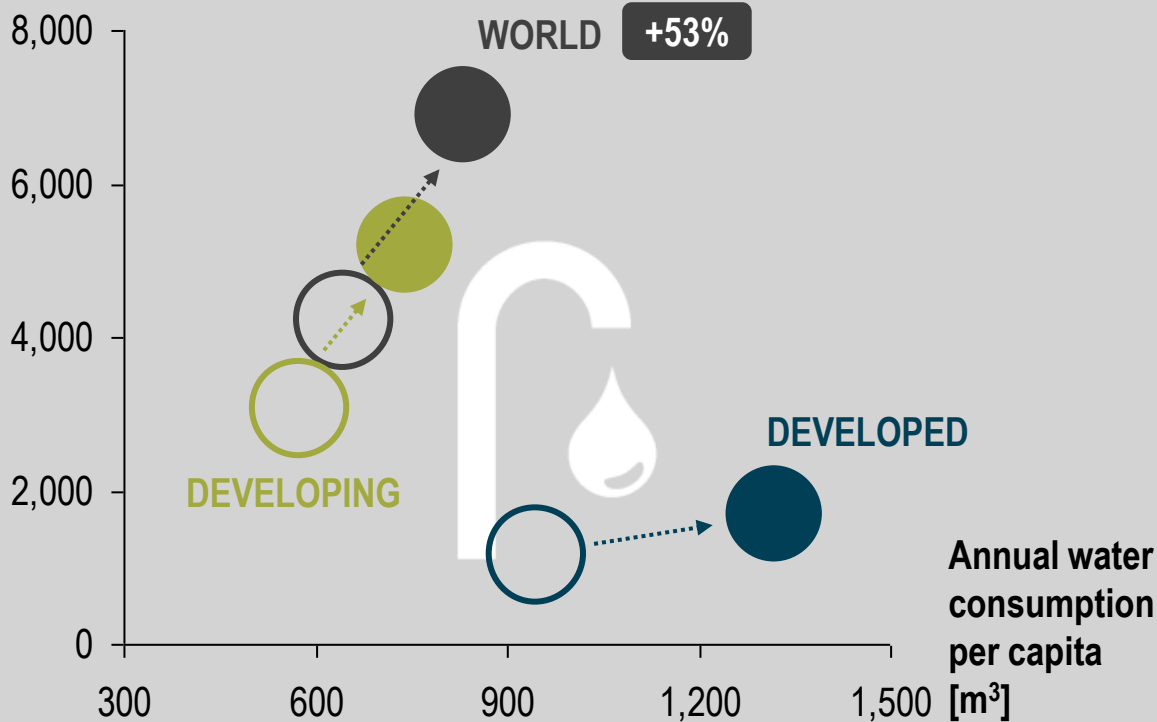
2. DEVELOPED VS. DEVELOPING COUNTRIES

- > The **gap in primary energy consumption between the developed and developing countries will widen**, with the developing countries consuming 79% more primary energy than the developed countries in 2030. Over the next 20 years, primary energy consumption in developing countries will grow about 15 times faster than in the developed countries. Back in 1990 the OECD and non-OECD countries consumed almost the same amount of primary energy (4,519 Mtoe and 4,125 Mtoe, respectively)
- > The **OECD countries' demand for primary energy will fall by 8.3 percentage points to 36% of the world's total in 2030**, down from 44% today and 52% in 1990. Although their relative share will decline, their total energy consumption will increase slightly by 2.6% (0.1% p.a.), reaching a consumption of 5,578 Mtoe by 2030. The increase between 1990 and 2010 (5,434 Mtoe) was 20%, i.e. nearly eight times the upcoming increase. The developed countries have only about 15% of the world's proven oil reserves and only 7.0% of natural gas
- > **The non-OECD countries will increase their demand for primary energy by 8.3 percentage points to 64% of the world's total in 2030**, up from 56% today and 48% in 1990. Their overall demand for energy will rise by 45% (1.9% p.a.), although this is slower than over the last 20 years (67%; 2.6% p.a.). In 2030 the non-OECD countries will consume 10,000 Mtoe, compared to 6,900 Mtoe today. The non-OECD countries will account for 93% of the world's energy increase. The developing countries hold about 85% of the world's proven oil reserves and 93% of natural gas

T3.2 WATER

Water demand will increase by 53% – The developing countries account for 75% of total demand

Total annual water demand [bn m³]



○ = 2010 ● = 2030

Source: IFPRI; FAO Water; IWMI; UN; Water Resources Group; WWF

1. WORLD

- > Assuming average economic growth and no efficiency gains, **annual global water requirements would grow by 53%** from 4,500 billion m³ today to 6,900 billion...

2. DEVELOPED VS. DEVELOPING COUNTRIES

- > **Total water demand will increase 18 percentage points faster in the developing countries** than in the developed countries by 2030. However, the gap in per capita water...

T3.2 WATER

Text behind animated chart (1/2)

1. WORLD

- > Assuming average economic growth and no efficiency gains, **annual global water requirements would grow by 53%** from 4,500 billion m³ today to 6,900 billion m³ in 2030. Annual per capita water consumption will increase by 27% to 830 m³ in 2030, up from 651 m³ today. However, since accessible water is limited to 4,200 billion m³ per year (3,500 billion m³ of surface water and 700 billion m³ of ground water), there would be a shortfall of 2,700 billion m³ in 2030. This **shortfall will be eliminated**. The water shortage will drive water prices up, making major R&D investments in water technology profitable and necessary, which will in turn significantly reduce the amount of water wasted
- > Without efficiency gains, **demand for water in agriculture is expected to rise by 40% by 2030** due to a rising population and changing dietary habits. It will account for 65% of the total demand for water in 2030 (71% today), therefore serving as the main lever for narrowing the future water gap. It takes an average of 2,000 liters of water to produce one kilo of rice, but 14,000 liters for one kilo of grain-fed beef. Only about 2-3 liters are required as drinking water; about 20-300 liters are used for domestic needs. The World Wide Fund for Nature (WWF) estimates that the global agriculture industry wastes an alarming 60% of the amount it uses p.a.
- > Water withdrawals from **industry will grow the fastest** over the next 20 years, rising from 16% today to 22% in 2030. **Municipal & domestic** water use is the smallest portion and **will decline further** over the next 20 years from 14% today to 12%
- > **Access to safe water resources** will improve and reach **86% of people in 2015**; however, the gap between rural and urban areas will still be huge in some regions. Eight out of ten people still without access to an improved drinking water source live in rural areas. 1.6 billion people have gained access to safe water sources since 1990. The proportion has improved from 30% in 1970 to 71% in 1990 and 79% in 2000

T3.2 WATER

Text behind animated chart (2/2)

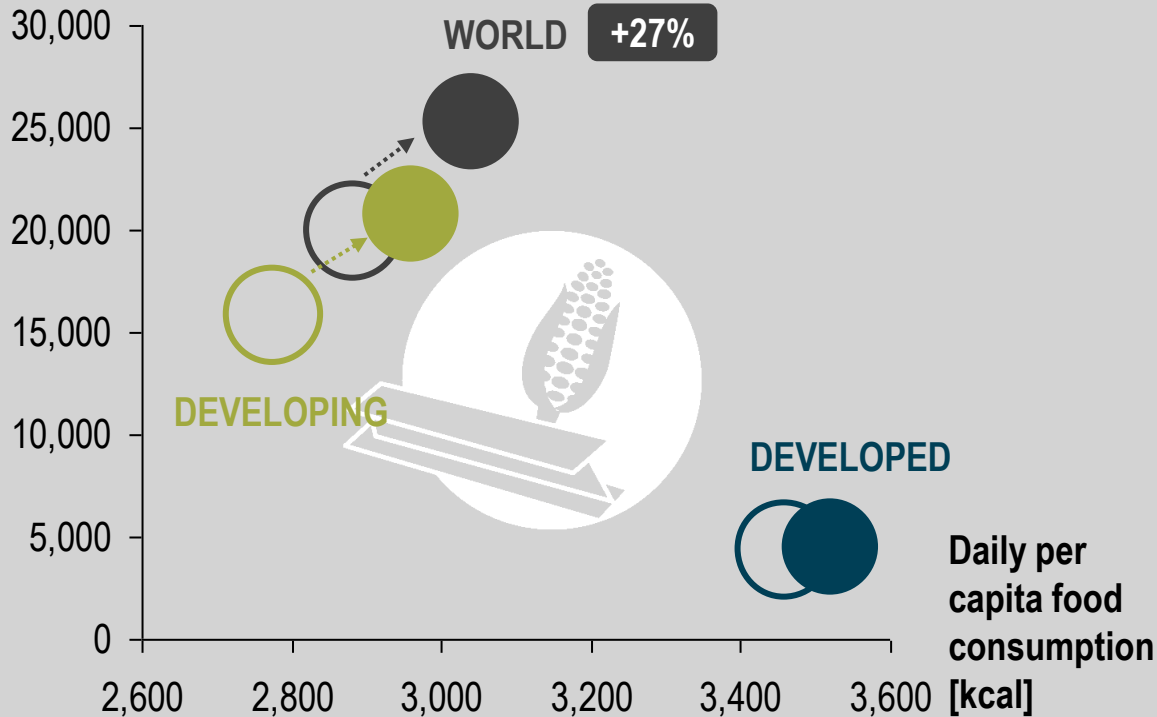
2. DEVELOPED VS. DEVELOPING

- > **Total water demand will increase 18 percentage points faster in the developing countries** than in the developed countries by 2030. However, the gap in per capita water consumption between the developed and developing countries will widen by 2030 due to the stronger population growth in the developing countries. **The share of water demand** in the different sectors (industrial, agricultural and domestic) **varies widely** between the developing and developed countries
- > The **developed countries' demand for water** will increase **40% by 2030**, but their share will decrease from 27% of the world's total to 24% in 2030. Total annual per capita water consumption will increase to 1,319 m³ in 2030, rising from 976 m³ today. In high income countries, industrial water use accounts for the largest share (59%), agriculture for only 30%, and domestic use for 11%. Surface water quality has improved in the past and will continue to improve. In 2008 only 2% of people lived in rural areas that still lacked access to improved water sources
- > The **developing countries** will steadily increase their demand for water due to growing populations and rising living standards. Water consumption is predicted **to rise by 58% up to 2030**. Total annual per capita water consumption will increase to 741 m³ in 2030, up from 581 m³ today. In low and middle income countries, agriculture accounts for the biggest share at 82%, followed by industrial (10%) and domestic use (8%). In terms of **water quality**, the high level of water pollution will only be partially reduced by 2030. Rapid urbanization and unsustainable agriculture are the main problems in upgrading water quality. Only 76% of the rural population (but 94% of the urban population) have **access to improved water sources today**. This is especially dramatic, since around 80% of diseases and deaths are related to water pollution

T3.3 OTHER COMMODITIES

Growing food consumption pressures the production of agricultural commodities

Total daily food consumption [bn kcal]



○ = 2010 ● = 2030

Source: FAO; Fraunhofer; USGS

1. WORLD

- > Demand for food will rise due to growing population and growing per capita food consumption. However, the growth rates in world agriculture¹⁾ will fall to 1.5% p.a. by 2030, compared to 2.1-2.3% p.a. over the past four decades. The world's

2. DEVELOPED VS. DEVELOPING COUNTRIES

- > In agricultural products, demand in developed countries will rise only slightly up to 2030: an average person will consume 3,520 kcal a day, an increase of...

T3.3 OTHER COMMODITIES

Text behind animated chart (1/2)

1. WORLD

- > **Demand for food will rise** due to growing population and growing per capita food consumption. **However, the growth rates in world agriculture¹⁾ will fall to 1.5% p.a.** by 2030, compared to 2.1-2.3% p.a. over the past four decades. **The world's food production is even threatened to fall** by 2030 as a result of the projected changes in the ecosystem due to climate change. Agricultural efficiency is at risk due to **water scarcity** and **limited sources of phosphate**, an important component of mineral fertilizer. Conflicts will arise over the use of agricultural products as food or energy. Price will determine use
- > **Raw materials²⁾** account for **more than 1/3 of all goods traded worldwide** and are the basis of economic development and growth. As some of these resources are scarce, countries need to secure them
- > **Iron is the most commonly used metal worldwide** (95% in terms of weight). **World resources** are estimated at over 800 billion tonnes of crude ore containing more than 230 billion tonnes of iron. Assuming consumption remains at current levels, **reserves will last for around 120 years**
- > Some **metals and minerals** that are important for current and future technologies are **very limited**. For example, current worldwide consumption of **indium** and **gallium** (indium about 850 t, gallium about 165 t) already far exceeds annual production. Indium is one of the most scarce resources. Since reserves of indium are estimated at only 16,000 t or 11,000 t economically degradable, they are expected to **dry up by 2030 unless substantial new sources are found**. Indium or gallium are used in new light sources such as LEDs, LCDs or OLEDs

1) Aggregate value of production, all food and non-food crops and livestock commodities

2) Raw materials are natural resources that include soft (agricultural) commodities, livestock, energy, and metals

T3.3 OTHER COMMODITIES

Text behind animated chart (2/2)

2. DEVELOPED VS. DEVELOPING COUNTRIES

- > In **agricultural products**, demand in developed countries will rise only slightly growing population and increasing per capita food consumption: an average person will consume 3,520 kcal a day, an increase of 1.7% between 2010 and 2030. Demand in developing countries will significantly rise due to both growing population and growing per capita food consumption. In 2030 an average person will consume 2,960 kcal a day, an increase of 6.6% between 2010 and 2030
- > **Developed countries are far poorer in raw-material resources than developing countries** and therefore depend heavily on the latter. **Conflicts will arise relating to the trade in raw materials** due to opposing private-sector and national interests, especially between the developed and developing countries. As resources get more and more scarce, **conflicts will intensify up to 2030**. The polarity between exporting and importing countries will make trading raw materials an issue of **national political interest**
- > **Developed countries' dependence on imported raw materials will increase up to 2030**, as more and more sources dry up, leaving fewer and fewer countries as potential suppliers. The EU has characterized 14 raw materials¹⁾ as especially critical in terms of their importance and scarcity. Of these critical raw material, developed countries are the number-one producer of only tantalum and beryllium. **The real prices of metals** are expected to **skyrocket**, so that wealth will be transferred from import-dependent developed countries to commodity suppliers. Inequitable access may become a cause for concern, especially in the **high-tech sector**, where new technologies are very dependent on minor or specialty metals
- > The **skyrocketing demand for raw materials** will be generated mainly by **developing countries**, especially those with high growth rates such as China and India. Resource-rich developing countries will gain a **competitive advantage**

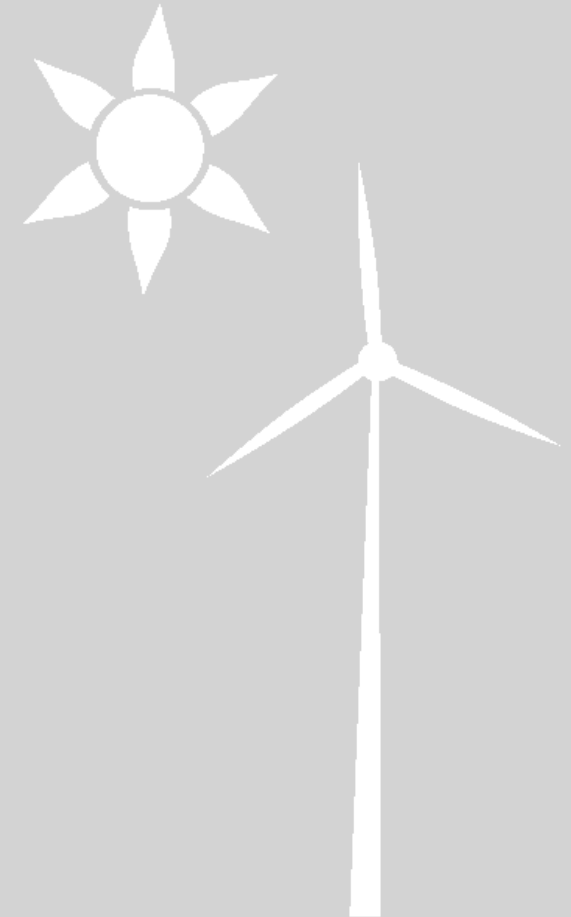
1) The 14 critical raw materials are: antimony, beryllium, cobalt, fluorspar, gallium, germanium, graphite, indium, magnesium, niobium, metals of the platinum group, rare earth metals, tantalum and tungsten

T3 CORPORATE ACTIONS (1)

Reduce consumption

1. REDUCE CONSUMPTION

- > Reducing the consumption of necessary input materials is the first way to cope with scarce resources. This requires **leveraging energy- and resource-saving technologies**
- > Resources should be saved in the **production process** and in the **product** itself. Products should be designed to require fewer materials, though without reducing quality. A more efficient arrangement and new technologies in the production process save energy and other resources
- > Especially in developing countries, competition for water will intensify among the agricultural, industrial and domestic sectors. In addition to **reducing water consumption**, companies should also **avoid pollution**



T3 CORPORATE ACTION (2)

Reduce dependency

2. REDUCE DEPENDENCY

- > To reduce the dependency on a specific resource, companies should try to **use substitute resources** that are less scarce
- > **Diversifying the product portfolio** and **supplementing it with services** is another strategy for making a company less dependent on single resources
- > **Raising the potential number of suppliers** reduces the dependency on single raw material suppliers, but has also downsides – for instance, higher prices due to smaller order volumes
- > Another way to secure resources is through **backward integration of suppliers**
- > To mitigate their vulnerability to price fluctuations (also medium-sized) companies should **hedge resource prices** or integrate **automatic price adjustments** into their long-term contracts with customers



T3 CORPORATE ACTION (3)

Appeal to consumers

3. APPEAL TO CONSUMERS

- > Consumers will become increasingly aware of resource scarcity. This awareness should be taken into account by offering **products with resource-saving features** and by focusing on such product features in **communication**
- > Resource-saving **production processes** should also be highlighted and used for **marketing purposes**
- > In addition, companies should also appeal to consumers and other stakeholders via **PR**, **investor relations**, etc. to build an image of responsible resource use



T3 FOR FURTHER INFORMATION (1)

Most important indicators



ENERGY



- > Total demand for primary energy [Mtoe]
- > Annual demand for primary energy per capita [toe]

> OIL

- > Price per barrel (159 liters) [USD]

WATER



- > Annual water consumption per capita [m³]
- > Share of industrial, agriculture and domestic use [%]

> BY STRESS

- > Less than 1,700 m³ renewable freshwater availability per person per year

> BY SCARCITY

- > Less than 1,000 m³ renewable freshwater availability per person per year

OTHER COMMODITIES



- > Total daily food consumption [bn kcal]
- > Daily per capita food consumption [kcal]

T3 FOR FURTHER INFORMATION (2)

Most important sources and institutions



MOST IMPORTANT SOURCES

- > **EIA:** Various reports on energy
- > **European Commission:** World energy, technology and climate-policy outlook 2030
- > **FAO Water:** Aquastat-Database
- > **IEA:** World Energy Outlook
- > **IPCC:** Fourth Assessment Report
- > **IWMI:** Global Water Outlook to 2025
- > **Shell:** Energy scenarios through 2050
- > **UN:** World Water Development Report 3
- > **UNDP:** Human Development Report
- > **USGS:** Mineral Commodity Summaries
- > **Water Resources Group:** Charting our Water Future

KEY INSTITUTIONS

- > **EIA:** U.S. Energy Information Administration
- > **European Commission**
- > **FAO Water:** Natural Resources Management and Development Department
- > **IEA:** International Energy Agency
- > **IEE:** Institute of Energy Economics
- > **IPCC:** Intergovernmental Panel on Climate Change
- > **IWMI:** International Water Management Institute
- > **UN:** United Nations
- > **UNCED:** United Nations Conference on Environment and Development
- > **USGS:** U.S. Geological Survey
- > **Water Resources Group**



T4 THE CHALLENGE OF CLIMATE CHANGE



T4 CLIMATE CHANGE

Increasing CO₂ emissions will lead to rising temperatures and put the ecosystem at risk

INCREASING CO₂ EMISSIONS



1. WORLD

CO₂ emissions will increase by 16% while per capita emissions will stay relatively stable at 4.2 t

2. DEVELOPED

CO₂ emissions will decline by 14%, accounting for 32% of the world's emissions

3. DEVELOPING

CO₂ emissions will increase by 38% to a global share of 68%. Per capita emissions will still be far below those of developed countries (41%)

GLOBAL WARMING



1. WORLD

The average global temperature will rise 0.5-1.5°C

2. DEVELOPED

Developed countries have more resources to handle the negative consequences of rising temperatures

3. DEVELOPING

Developing countries will suffer more from the negative consequences of higher temperatures

ECOSYSTEM AT RISK



1. WORLD

Increasing land loss, more extreme weather and decreasing biodiversity

2. DEVELOPED

Are less affected by loss of species than developing countries, as they already experienced considerable losses in the 20th century

3. DEVELOPING

Increasing loss of species by 2030. Agricultural land available per person will decline by 20% to 0.4 acres

CORPORATE ACTION

1. USE BUSINESS OPPORTUNITIES

Leverage new business opportunities resulting from climate change

2. REDUCE CO₂ EMISSIONS

Set ambitious targets for products and production process

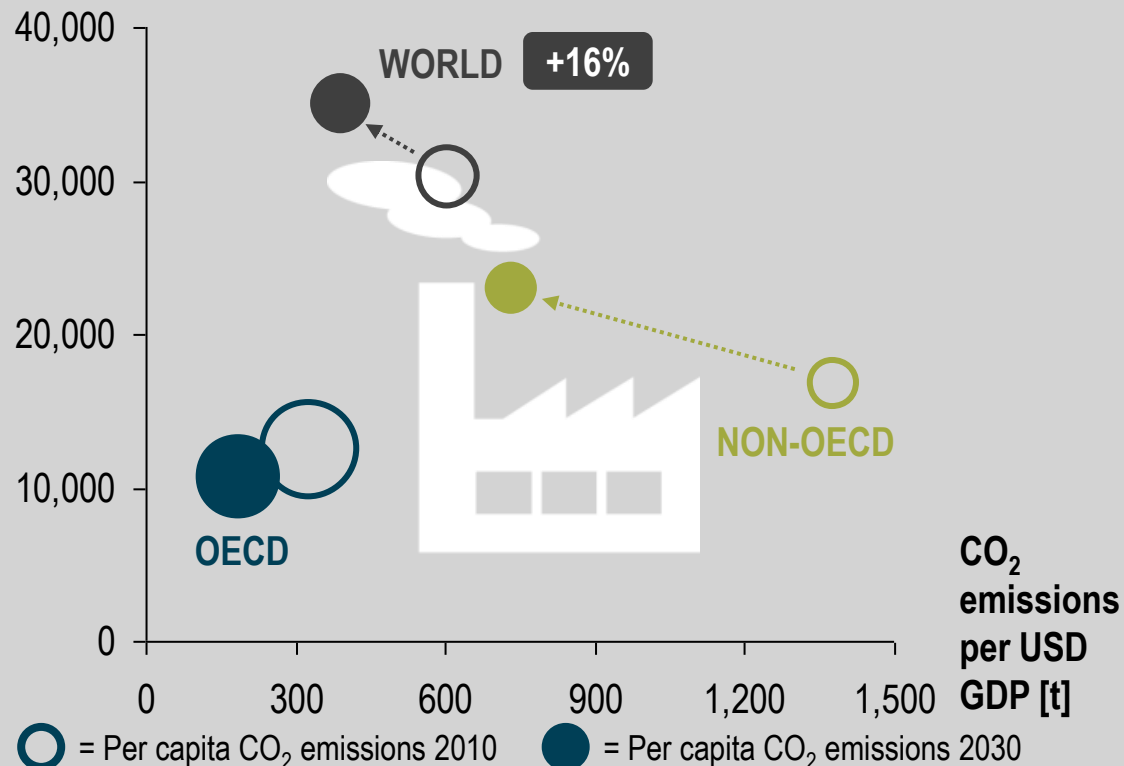
3. MANAGE CLIMATE RISK

Be prepared for risks resulting from climate change

T4.1 CO₂ EMISSIONS

World CO₂ emissions will be 16% higher – Per capita emissions 2.5 times higher in OECD countries

Total CO₂ emissions from fuel combustion¹⁾
[Mt]²⁾



1) Fuel includes coal, oil and gas; data according to the IEA New Policies Scenario (medium variant)

2) Mt (megaton) = One million tonnes

Source: IEA; EIA; IPCC; UNPD

1. WORLD

- > Increasing concentrations of **greenhouse gases (GHG)** have been the **main driver of rising temperatures** since the middle of the 20th century. The main...

2. DEVELOPED VS. DEVELOPING COUNTRIES

- > According to the IEA New Policies Scenario, CO₂ emissions from fuel combustion of **OECD countries will be reduced by 14%** over the next 20 years, while...

T4.1 CO₂ EMISSIONS

Text behind animated chart (1/2)

1. WORLD

- > Increasing concentrations of **greenhouse gases (GHG)** have been the **main driver of rising temperatures** since the middle of the 20th century. The main GHG in the earth's atmosphere are water vapor, carbon dioxide, methane, nitrous oxide and ozone. **CO₂ is the most important GHG** that can be directly influenced by humans. Anthropogenic CO₂ emissions from fuel combustion are by far the greatest contributor of GHG emissions
- > By 2030, world CO₂ emissions from fuel **combustion (coal, oil and gas) will increase 16%** to 35,053 megatons (Mt) and therefore **slow down compared to the past 20 years** (+44%). In absolute numbers, the increase will be 4,838 Mt and therefore half the amount of the past 20 years. In 1990, CO₂ emissions from fuel combustion amounted to 20,924 Mt
- > The concentration of CO₂ in the earth's atmosphere is approximately 390 ppm (parts per million) by volume as of 2010. This is about **30% higher than atmospheric CO₂ levels were for at least 800,000 years** before the Industrial Revolution. Because of slow removal processes, atmospheric CO₂ will **continue to increase** in the long term even if emissions are substantially reduced from their present levels

T4.1 CO₂ EMISSIONS

Text behind animated chart (2/2)

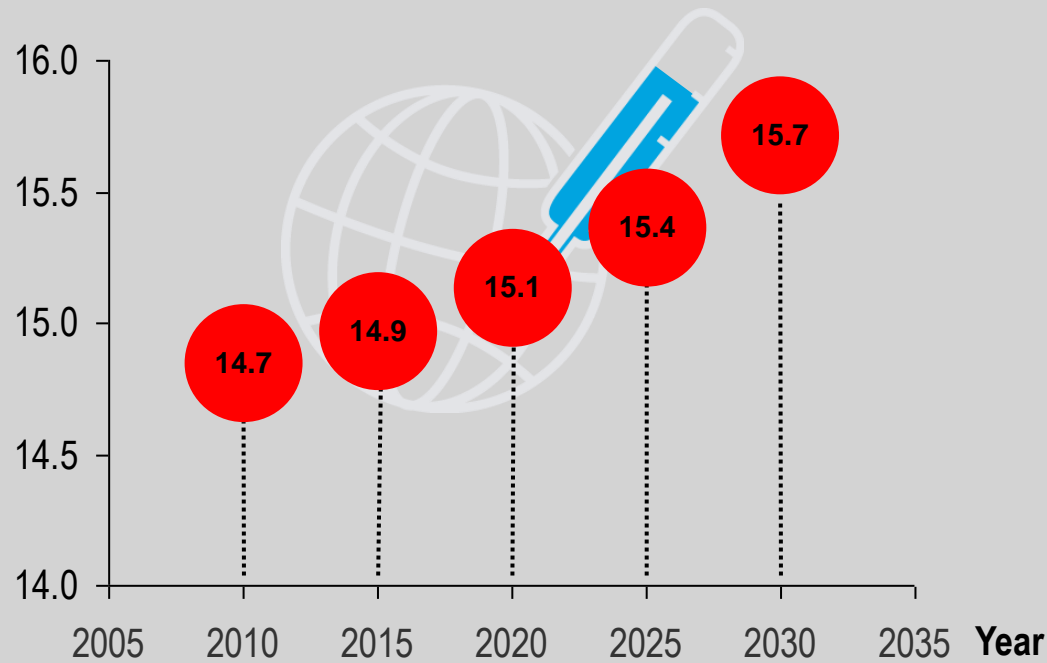
2. DEVELOPED VS. DEVELOPING COUNTRIES

- > According to the IEA New Policies Scenario, CO₂ emissions from fuel combustion of **OECD countries will be reduced by 14%** over the next 20 years, while **non-OECD countries will increase their emissions during the same period by 38%**. Therefore, non-OECD countries will increase their share of global CO₂ emissions by 10%. Comparing emissions per capita, OECD countries will still emit 2.5 times more CO₂ than non-OECD countries in 2030. The picture changes when looking at CO₂ emissions relative to GDP. In this case, non-OECD countries will emit about four times more CO₂ than OECD countries in 2030 due to their older technology and infrastructure
- > **OECD countries** will **decrease their CO₂ emissions** from fuel combustion **by 0.7% p.a.** to 10,732 Mt in 2030. At the same time, their CO₂ emission per capita will decrease to 8.1 t in 2030, from 10 t today. In 2030, they will account for **32% of the world's emissions**, down from 43% today and 54% in 1990. As they will have only 15% of the world's population in 2030, their emissions per capita should be further reduced
- > **Non-OECD countries** are estimated to release more than **twice the amount of CO₂** from fuel combustion (22,990 Mt) into the atmosphere in 2030 compared to OECD countries. They **will increase their CO₂ emissions by 1.6% annually**, which is actually a slowdown by 50% compared to the past 20 years (3.0% p.a.). In 2030, they will account for **68% of the world's emissions** with 85% of the world population, up from 55% today and 44% in 1990. This shows the risk that developing countries will increase CO₂ emissions even further. In these countries, CO₂ emissions per capita will be 3.3 t in 2030, up from 2.8 t today

T4.2 GLOBAL WARMING

Global temperature will rise 0.5-1.5 °C, leading to rising sea levels and more extreme weather

Average global temperature [°C]



Source: CDIAC; GGISS; IPPC; EIA; Stern Report; NIC; UNFCCC

1. WORLD

- > The average global temperature will **rise 0.5-1.5 °C** between now and 2030. Over the past 20 years, an overall temperature **increase...**

2. DEVELOPED VS. DEVELOPING COUNTRIES

- > **Temperature increase varies greatly between regions and even within countries.** Therefore, no general statements can be made concerning increases in developed and...

T4.2 GLOBAL WARMING

Text behind animated chart (1/1)

1. WORLD

- > The average global temperature will **rise 0.5-1.5 °C** between now and 2030. Over the past 20 years, an overall temperature **increase of 0.5 °C has been measured**, with land temperatures rising **about twice as fast as ocean temperatures**. An increasing rate of warming has taken place especially over the past 25 years. During the last Ice Age 18,000 years ago, the average global temperature was **6 degrees lower than today**. Even with relatively minor average temperature increases, the nature, frequency and intensity of extreme events, such as tropical cyclones (including hurricanes and typhoons), floods, droughts and heavy precipitation are expected to rise. Sea level will rise between 6 and 11 centimeters during the next 20 years. Two processes are at work: melting polar ice and the expansion of sea water as oceans get warmer, both a result of global warming

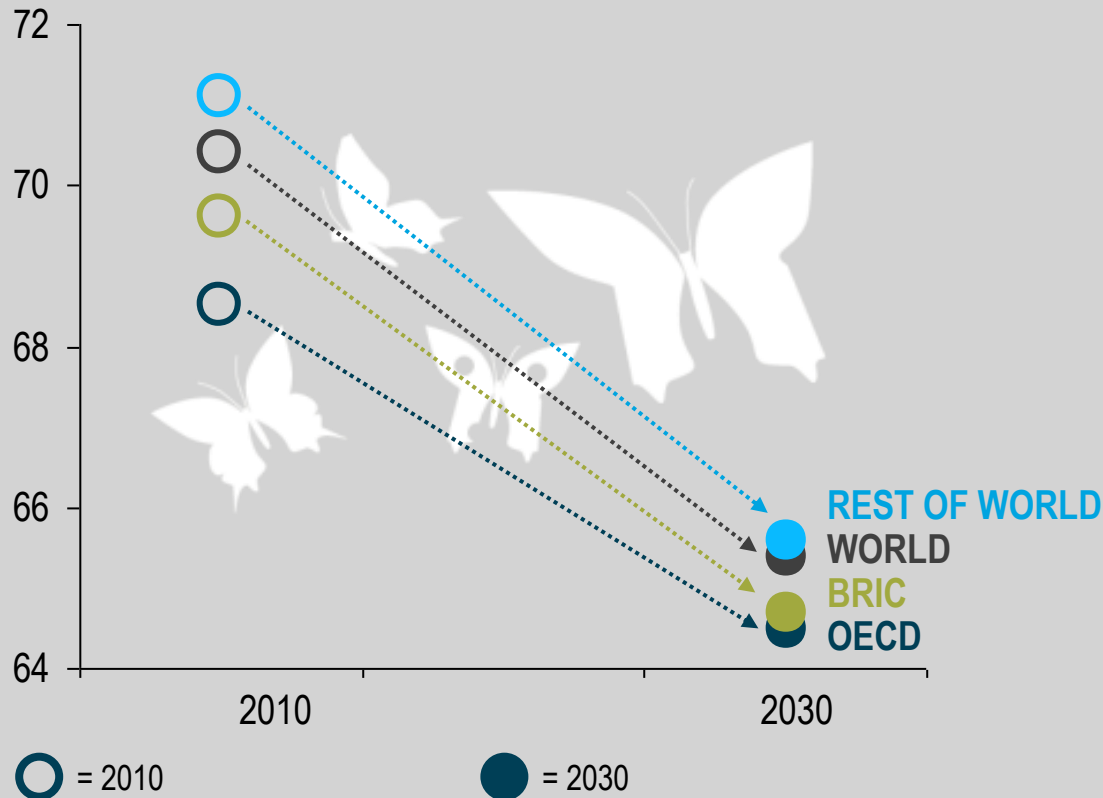
2. DEVELOPED VS. DEVELOPING COUNTRIES

- > **Temperature increase varies greatly between regions** and **even within countries**. Therefore, no general statements can be made concerning increases in developed and developing countries. However, there is broad consensus that **developing countries will suffer more** from the negative consequences of temperature increase as they have fewer resources to adapt: socially, technologically and financially. They will also be more affected as they depend more heavily on the agricultural sector. Climate change is expected to have far-reaching effects on the sustainable development of developing countries
- > The United Nations Framework Convention on Climate Change (UNFCCC) has estimated that by **2030, developing countries will require USD 28-67 billion to adapt to climate change**. This corresponds to 0.06-0.2% of the projected GDP of the developing countries in 2030

T4.3 ECOSYSTEM AT RISK

Biodiversity will be further reduced in both the developed and developing countries to around 65%

Biodiversity
[% of potential]



Source: UNEP; Millennium Ecosystem Assessment; Stern Report; OECD

1. WORLD

- > Our ecosystem and its biodiversity are **crucial to mankind** in order to ensure food security, clean water, protection against extreme weather and provision of...

2. DEVELOPED VS. DEVELOPING COUNTRIES

- > The scope of changes in ecosystems and biodiversity differs more so between individual countries than between developed vs. developing countries. Therefore...

T4.3 ECOSYSTEM AT RISK

Text behind animated chart (1/2)

1. WORLD

- > Our ecosystem and its biodiversity are **crucial to mankind** in order to ensure food security, clean water, protection against extreme weather and provision of medicines. These benefits have been estimated to be worth between **USD 21-72 trillion each year**, a huge sum compared to the world GDP of USD 62 trillion in 2009
- > The **conversion and destruction of land will continue** over the next 20 years. With a "business as usual" scenario, **11% of the natural areas remaining in 2000 could be lost by 2050**, which equals 7.5 million square kilometers – Roughly the size of Australia. The main reason for land loss is conversion for agriculture, the expansion of infrastructure and climate change. Environmental degradation is augmenting the impact of natural disasters such as floods and droughts, affecting 270 million people annually and killing some 124,000 people worldwide every year
- > According to the Stern Report on the Economics of Climate Change, our actions over the next few decades related to climate change could lead to major disruptions in economic activity and the **cost of extreme weather alone** could reach **0.5-1.0% of world GDP** per year by 2050
- > The world's biodiversity will be reduced by 5 percentage points, from currently 70% of its original potential (100% some centuries ago) to 65% in 2030. In 1700, biodiversity was still at about 98% of its potential and showed its first strong decrease in the 20th century. The four factors with the greatest impact on **loss of biodiversity** by 2030 will be land use change for agriculture, followed by infrastructure, climate change and forestry. A temperature **increase of 2.0°C will put 20-30% of species at a much higher risk of extinction**. Nearly 17,000 species of plants and animals are known to be threatened with extinction today. By 2030, 60% of coral reefs could be lost through fishing, pollution, diseases, invasive alien species and coral bleaching

1) Defined as areas where at least 30% of the landscape is in croplands, shifting cultivation, confined livestock production or freshwater aquaculture

T4.3 ECOSYSTEM AT RISK

Text behind animated chart (2/2)

2. DEVELOPED VS. DEVELOPING COUNTRIES

- > The scope of changes in ecosystems and biodiversity differs more so between individual countries than between developed vs. developing countries. Therefore, **analysis needs to be done primarily on the regional level**; however, some general statements are possible on aggregate level
- > Ecosystems characterized by a lack of water, so-called **dryland systems**, cover 41% of earth's land area and more than 2 billion people (about 1/3 of the total population) inhabit them today. Within those dryland systems, plant production is limited due to water scarcity. As 90% of the population living in dryland systems is found in developing countries, those countries will be more affected by a further increase in dryland systems
- > **Biodiversity** in the OECD countries will decline by 4 percentage points within the next 20 years, from 69% currently to 65% in 2030. The BRIC countries will start at a higher level – 70% of their potential today – but losses will be even stronger (4.9 percentage points), also reaching 65% in 2030. The rest of the world will decrease the most (5.5 percentage points), keeping just 66% of their potential in 2030
- > In all regions, the **main reason for the decline in biodiversity** will be agriculture, followed by infrastructure. The amount of **agricultural land available** for each person in developing countries will decline by 20% between today and 2030. In 2030, each person will have on average 0.4 acres available, down from 0.5 acres today and 0.8 acres in the early 1960s

T4 CORPORATE ACTIONS (1)

Seize new business opportunities

1. SEIZE NEW BUSINESS OPPORTUNITIES

- > New business opportunities will arise from climate change in terms of **products**, **emissions brokering** and **reputation/brand value**
- > On the **product side**, new eco-friendly products or technologies will open up business opportunities and dominate the markets. Companies should focus on using greener materials, reducing packaging and compensating for their carbon footprint by getting involved in projects to improve the environment
- > Companies need to clearly **communicate their achievements** in terms of environmental friendliness and thus improve their **reputation and brand value**. They can further intensify their efforts to actively protect the ecosystem and biodiversity, for example by founding or joining groups with such objectives
- > In addition, companies could set up **carbon funds** and engage in **emissions brokering** or special emission trading schemes, such as the Clean Development Mechanism (CDM) of the Kyoto Protocol



T4 CORPORATE ACTIONS (2)

Reduce CO₂ emissions

2. REDUCE CO₂ EMISSIONS

- > Companies need to reduce their CO₂ emissions in order to **comply with legal requirements** and improve their **reputation**
- > As energy use is the main cause of CO₂ emissions, the focus should lie on **reducing the amount of energy resources used**
- > Within the value chain, **production and logistics** in particular should be optimized, as they harbor the greatest potential for reducing CO₂ emissions



T4 CORPORATE ACTIONS (3)

Manage climate risk

3. MANAGE CLIMATE RISK

- > It will become increasingly important for companies to **focus on the potential risks arising from climate change** and include them in **future business planning**
- > Besides exploring and quantifying potential risks, the right **insurance policies** must be found and rising risk premiums budgeted for
- > The **risk of legal action** (e.g. class-action lawsuits related to climate change), **business disruption** caused by extreme weather events (e.g. floods, storms, droughts and forest fires) or long-term physical changes (e.g. reduced water availability) need to be considered and the right action taken
- > Costs may also arise due to **new emission regulations** or **increased energy costs**. New **catastrophe bonds** have emerged over the past few years that can be used to manage future climate change risks



T4 FOR FURTHER INFORMATION (1)

Key indicators



CO₂ EMISSIONS



- > Absolute emissions of carbon dioxide [Mt]
- > Change in carbon dioxide emissions [%]

> CO₂ CONCENTRATION

- > Concentration of carbon dioxide in the atmosphere as parts per million [ppm]

GLOBAL WARMING



- > Average global temperature [degrees Celsius]
- > Change in global temperature [degrees Celsius]

ECOSYSTEM



- > Conversion and destruction of land as share of natural areas remaining [%]
- > Risk of extinction of species as share of all species [%]

> BENEFIT

- > Benefits of the ecosystem and biodiversity [USD]

> COST

- > Cost of extreme weather as share of GDP [%]

T4 FOR FURTHER INFORMATION (2)

Key sources and institutions



KEY SOURCES

- > **IPCC:** Assessment Reports
- > **Stern Review:** Stern Review on the Economics of Climate Change
- > **UNEP:** Global Environment Outlook
- > **WMO:** Weather Extremes in a Changing Climate
- > **WWF:** Living Planet Report
- > **OECD:** Environmental Outlook to 2030
- > **IEA:** World Energy Outlook
- > **NIC:** Global Trends 2025

KEY INSTITUTIONS

- > **IPCC:** Intergovernmental Panel on Climate Change
- > **UNEP:** United Nations Environment Programme
- > **UNFCCC:** United Nations Framework Convention on Climate Change
- > **WMO:** World Meteorological Organization
- > **WWF:** World Wide Fund for Nature
- > **OECD:** Organisation for Economic Co-operation and Development
- > **IEA:** International Energy Agency
- > **NIC:** National Intelligence Council
- > **CDIAC:** Carbon Dioxide Information Analysis Center
- > **GISS:** Goddard Institute for Space Studies

TREND COMPENDIUM 2030



T5 DYNAMIC TECHNOLOGY & INNOVATION



T5 TECHNOLOGY & INNOVATION

Technology diffusion increases and innovations will change our lives –
The age of Life Sciences has begun

TECHNOLOGY DIFFUSION



1. WORLD

Technology diffusion will increase as new technologies are being adopted faster and innovation cycles shorten

2. DEVELOPED

Already being on a high level technology diffusion will accelerate

3. DEVELOPING

Technology diffusion reduces poverty and facilitates doing business even in less developed regions

POWER OF INNOVATION



1. WORLD

Robotics, virtual reality and the Internet of things will change our lives

2. DEVELOPED

The Japanese aim to have a robot in every home by 2015; South Korea has the same goal for 2020

3. DEVELOPING

Will soon catch up in innovation capacity. China's R&D investments will be about 80% higher than Germany's in 2020

THE AGE OF LIFE SCIENCES



1. WORLD

Basic innovations will be expected from Life Sciences, answering some of the world's challenges

2. DEVELOPED

Biotechnology is likely to account for nearly 3% of the GDP of OECD countries

3. DEVELOPING

These countries will be the main markets for green and white biotechnology, paving the way to sustainable agriculture

CORPORATE ACTION

1. ESTABLISH COOPERATIVE PARTNERSHIPS & NETWORKING

Strengthen your R&D position

2. WATCH THE LATEST TECHNOLOGY TRENDS

Broaden your perspective and identify market trends

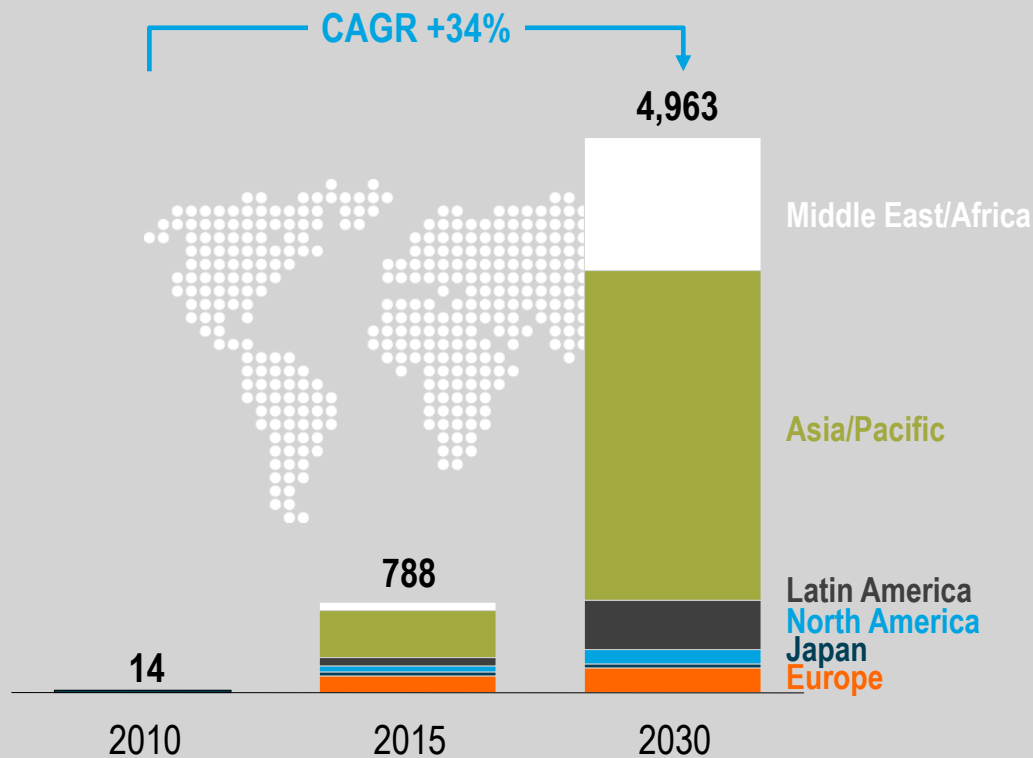
3. THINK DIVERGENTLY & CONVERGENTLY

View divergent and convergent thinking as two sides of the same coin

T5.1 TECHNOLOGY DIFFUSION

Technology will spread at high speed throughout both developed and developing countries

Number of mobile-only broadband users [m]



Source: Cisco; The World Bank; Z-punkt; Roland Berger

1. WORLD

- > **Technology diffusion will continue and even speed up by 2030.** Taking the number of mobile-only Internet users (those that do not use fixed broadband) as one...

2. DEVELOPED VS. DEVELOPING COUNTRIES

- > Regarding technology diffusion, there is still a **huge gap between the developing and developed countries**, as the former are primarily adopting well-established...

T5.1 TECHNOLOGY DIFFUSION

Text behind animated chart (1/2)

1. WORLD

- > **Technology diffusion will continue and even speed up by 2030.** Taking the number of **mobile-only Internet users** (those that do not use fixed broadband) as one indicator, their number is still only 14 million, but it is expected to grow 34% p.a. by 2030, connecting 60% of the world's population to mobile broadband in 2030, up from less than 1% today. Besides being adopted at increasing rates, technologies' performance will also grow exponentially. The average broadband speed will grow by a factor of 100 or more, from less than 1 Mbps to more than 100 Mbps in 2030
- > **The diffusion of technologies is closely related to income.** It is both a critical determinant of income and a result of rising incomes. As the world economy grows and countries get richer, the diffusion of technologies accelerates. In turn, as diffusion of technologies increases, a country's productivity rises, resulting in even stronger economic growth. As the world's wealth will grow by 4.0% p.a. from a real GDP of USD 62 trillion today to USD 135 trillion in 2030, the spread of technology will likewise increase further in that period
- > Furthermore, the **importance of technology will increase** within the next twenty years as **new technologies are being adopted faster** and **innovation cycles become shorter**. It used to take 52 years for 5% of the population to adopt a new technology, and another 13 years to get to the 25% mark. But between 1975 and 2000, it took on average just 3 years for the world to go from a diffusion rate of 5% to 25%. This trend will continue by 2030 as product life cycles become ever shorter

T5.1 TECHNOLOGY DIFFUSION

Text behind animated chart (2/2)

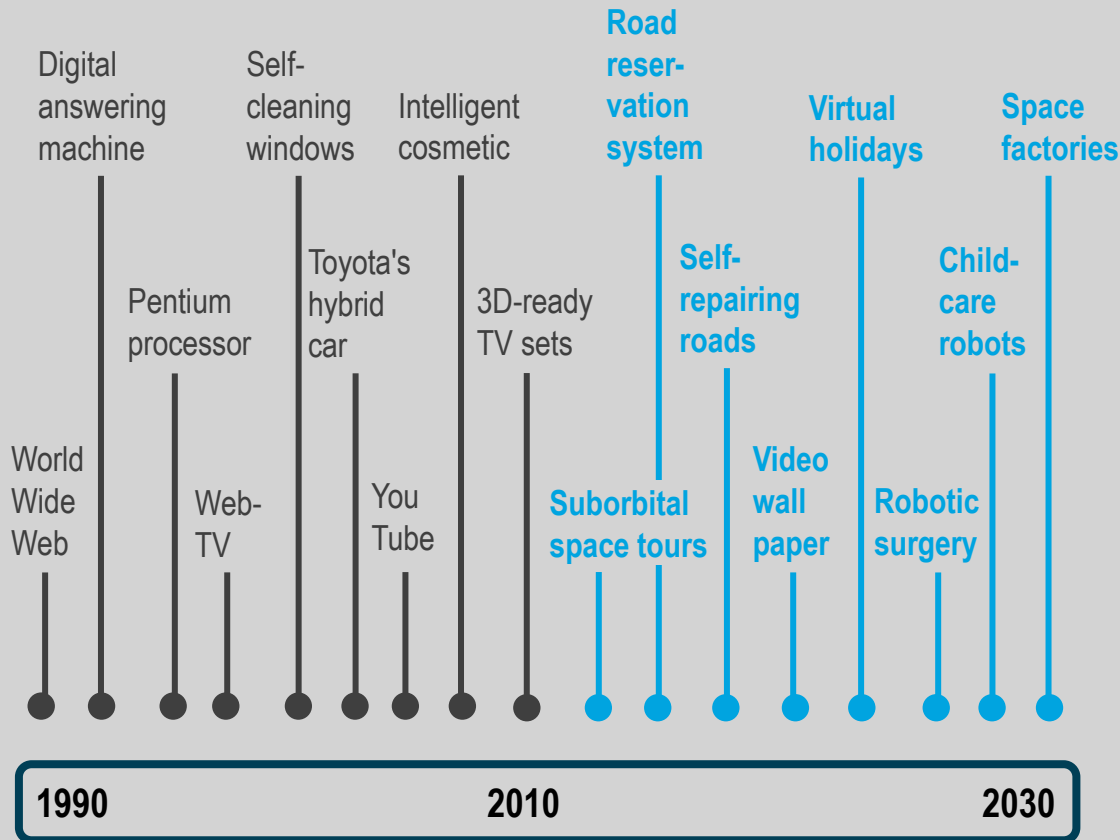
2. DEVELOPED VS. DEVELOPING COUNTRIES

- > Regarding technology diffusion, there is still a **huge gap between the developing and developed countries**, as the former are primarily adopting well-established technologies. However, **technological progress increased 40 to 60% faster in developing countries** than in developed countries between the early 1990s and early 2000s. As this trend continues, the technology **gap between the developed and developing countries will narrow**. However, developing countries still have a long way to go, as their technological level is currently only one-quarter of that in high-income countries
- > **Technology diffusion will accelerate in the developed countries** as the speed of the **adoption of new technologies will increase** and existing technologies are being substituted faster by new ones. Users of **mobile only broadband** will grow from less than 1% today to 19% in 2015, representing an **annual growth rate of 90%**. As this trend is expected to slow down, we estimate that in 2030 30% of the population will use mobile Internet exclusively.
- > The diffusion of technology is **especially important for developing countries** as it helps to **reduce poverty**. Much of the strong projected performance of developing countries can be attributed to technological progress. **Agricultural technology diffusion** plays a particularly important role in low-income countries. Technological diffusion has helped to raise incomes and reduce the share of people living in absolute poverty from 29% in 1990 to 18% in 2004. The growth of mobile phone usage is also correlated with GDP and local economic growth, as they make it **possible to do business** in developing regions. The penetration rate of **mobile-only Internet users will increase from 0.1%** today to 9.3% in 2015 and is likely to reach 65% in 2030. In some cases, newer technologies leaptfrogged over older ones; for example, mobile phones now have higher penetration rates in many countries than fixed-line telephones

T5.2 INNOVATION

Innovations can dramatically change our private and business lives –
Virtual holidays and robotic surgery to come

Selected past and future innovations



Source: World Future Society; Forum for the Future; ZTC; The World Bank; IBM

1. WORLD

- > The **basic innovations of the next 20 years are not easily predicted** and there is no consensus of what to expect in 2030. For example, Verner Vinge, a pioneer in Artificial...

2. DEVELOPED VS. DEVELOPING COUNTRIES

- > The **innovation potential of the developed and developing countries differs greatly**, as the developed countries have more financial and personal resources available...

T5.2 INNOVATION

Text behind animated chart (1/3)

1. WORLD

- > The **basic innovations of the next 20 years are not easily predicted** and there is no consensus of what to expect in 2030. For example, Vernor Vinge, a pioneer in Artificial Intelligence (A.I.), predicts that A.I. will surpass human intelligence after 2020, whereas THE FUTURIST puts the date in 2032. Predictions about future innovations are always risky – they may fail to materialize or do so at a different time – if and when they come true, they will **dramatically change and dominate our lives**. Therefore, we need to look at those potential changes
- > A relatively indisputable trend that will continue in the future is the **miniaturization of products**, making **nanotechnology** a central technology of the future. The nanotechnology sector will be one of the fastest growing within the next few years (15% p.a. between 2003 and 2015). Nanotechnology will impact many industries, such as ICT, automotive or the medical sector, providing even smaller and more powerful components. In 2020, we expect to find **nanobots in toothpaste** that attack plaque
- > Some great innovations are expected from **Life Sciences**, including biotechnology, medicine and pharmaceuticals, which will improve our life conditions by 2030. As Life Sciences will be the **leading science for the next decades**, we have treated it as a separate subtrend (T5.3)
- > The probability of upcoming innovations can also be derived from **challenges of the future**, such as **scarcity of resources** (see trend 3) or **climate change** (see trend 4), as they need answers that often can be found only in innovations. **Energy, sustainability and environment are the top research topics in 2010**. By 2030, renewable energy will replace fossil carbon and carbon-dioxide fixation technologies are expected to be in use for environmental protection by 2015 already

T5.2 INNOVATION

Text behind animated chart (2/3)

1. WORLD

- > **Robotics** will dramatically change our lives by carrying out tasks that humans normally do themselves today. At first, they will play a supportive role – as early as 2015, there will be robots for almost any job in homes and hospitals. Another example would be a robotic fish equipped with tiny chemical sensors which will act **as water pollution police**. However, some experts predict that already in 2035, robots are expected to completely replace humans in the workforce, therefore raising concerns about employment
- > **Information and communication technologies** were the main driver of innovations over the last 10 years. Around the year 1990, the World Wide Web, the Internet protocol (HTTP) and WWW language (HTML) were invented and the Pentium processor in 1993. But the international Delphi-Study 2030 shows that ICT will remain critically important over the next 20 years, influencing our private and business lives with innovations such as **cloud computing and virtual realities**
- > **Ubiquitous computing** will bring the **Internet of things**, a more physical version of the World Wide Web, to life. By 2020, the Internet of things will pervade all aspects of private life with small chips implemented in all kind of objects to interconnect with each other and with the Internet. Therefore, objects can be operated by humans from anywhere. Your refrigerator will tell your shopping assistant that you are low on milk, and she in turn will order new milk for home delivery. Companies already use the interaction between objects today for logistical processes to optimize their asset management and automate their warehouses

T5.2 INNOVATION

Text behind animated chart (3/3)

2. DEVELOPED VS. DEVELOPING

- > The **innovation potential of the developed and developing countries differs greatly**, as the developed countries have more financial and personal resources available. However, by 2030 **some developing countries** such as China and India will become **major competitors of the latest technologies and innovations from developed countries**. For example, China actively pursues leadership in areas such as environmentally friendly technologies and alternative energy. However, most developing countries will be limited to minimal participation at the global technological frontier
- > Among the **developed countries**, the United States is currently the leader in terms of innovation capacity¹⁾, closely followed by Switzerland and Sweden. Germany is only number 9 out of 17 industrial states. Germany aims to spend 3% of its GDP on R&D, a target which should be reached in 2018. Concerning the development of robots for the home, the US lags behind Japan. The Japanese aim to have a robot in every home by 2015, the South Koreans by 2020. According to THE FUTURIST, the **robot population will surpass the human population** in the developed world by 2025 and a **space hotel** will accommodate 350 guests in 2025
- > Among the **developing countries**, the **upper-middle income countries achieve only 3.3% of the scientific innovation and invention rate²⁾ of the high income countries**, the lower-middle & low income countries less than 0.6%. However, looking at the increase in technological achievement, the upper-middle income countries reach almost twice the speed (192%) of the developed countries. Therefore, **they will quickly catch up to the developed countries by 2030**. China currently invests 2.0% of its GDP in R&D and aims to increase that to 2.5% in 2020. Hence, absolute investment in R&D will be about 80% higher in China compared to Germany in 2020. The rate of technological achievement is still increasing 57% more among the lower-middle income countries than in the developed countries. Only in the low-income countries will the gap in scientific innovation to the developed countries widen

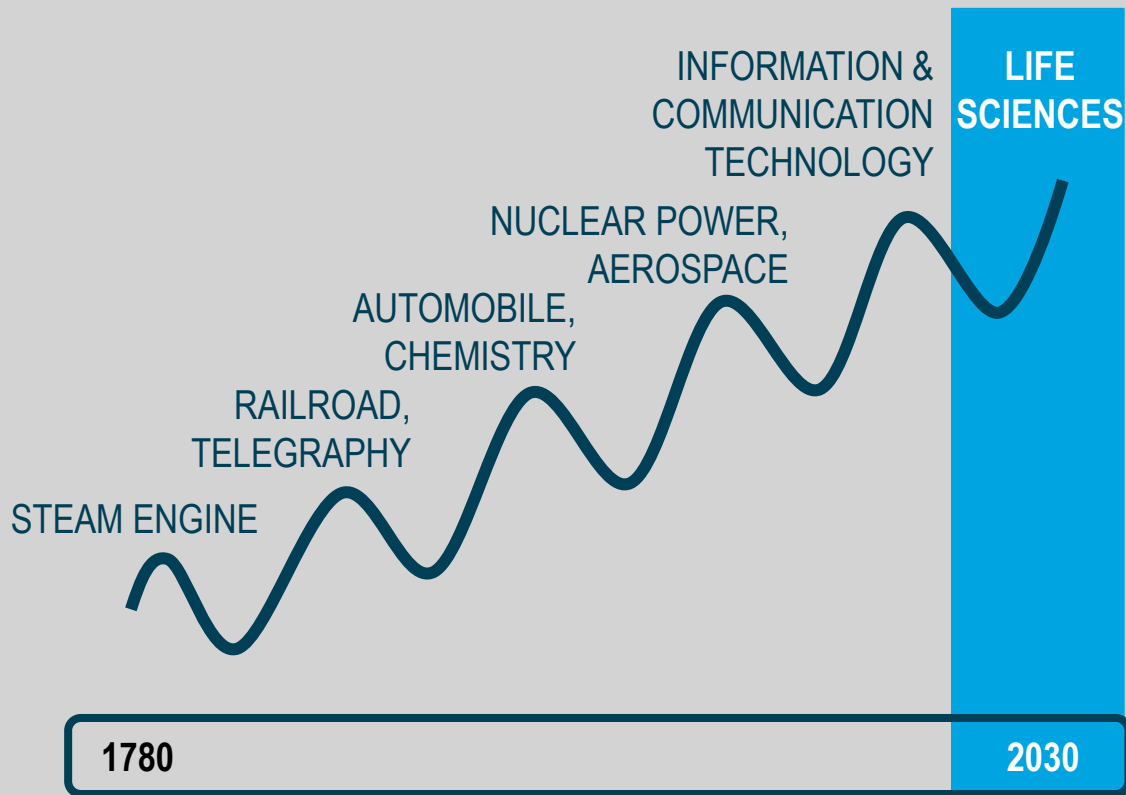
1) Innovation capacity is ranked on a scale of 1 to 7 looking at several quantitative indicators on the input (e.g. spending for education, number of scientist) and on the output side (e.g. patents, turnover of the high tech industry, and qualitative data by consulting experts)

2) Calculated from the number of scientific/technical journal articles and patents granted by the United States and European Patent and Trademark Office compared to population

T5.3 LIFE SCIENCES

They will be the focus of research for the next two decades, producing many important innovations

Basic innovation and Kondratiev waves



Source: Datamonitor; BioWorld; IMS; BVMed; OECD; PwC; Deloitte

1. WORLD

- > Basic innovations often come in certain cycles, called **Kondratiev waves**. The theme of the **next cycle leading up to 2030 will be Life Sciences**. The last cycle, between...

2. DEVELOPED VS. DEVELOPING COUNTRIES

- > **The gap between healthcare in rich and poor countries is huge but expected to narrow by 2030**. Today, the OECD countries spend USD 3,000 per person per...

T5.3 LIFE SCIENCES

Text behind animated chart (1/3)

1. WORLD

- > Basic innovations often come in certain cycles, called **Kondratiev waves**. The theme of the **next cycle leading up to 2030 will be Life Sciences**. The last cycle, between 1990 and 2010, was driven primarily by ICT, which will still have a strong impact over the next 20 years
- > **Life Sciences** comprises different fields of science, of which the most important ones are **biotechnology, medicine and pharmaceuticals**. Pharmaceuticals is currently the biggest sector in terms of global revenues, followed by medical devices and biotechnology
- > The global **pharmaceuticals market** pulls in USD 844 billion annually. It will experience the slowest growth up through 2014 (2.3% p.a.) but will grow further by 2030. As the aging population consumes three times as many drugs as younger people, drug spending is expected to grow. Many new medicines will be developed over the next 20 years, such as **medicines to ease neuropathic pain and hypertension, stomach cancer and diabetes**. One challenge facing the pharmaceutical industry how to cope with the **growing resistance to certain medicines**. **Urbanization** and greater mobility will produce **new pathogens** similar to SARS – they spread very fast and are difficult to treat
- > In medicine, the **medical technology market** (technical devices for diagnostics and therapy) is one of the biggest markets, generating about USD 300 billion annually. Over the past few years, it grew by 10% p.a. and will continue to grow significantly up through 2030, due to ongoing population growth, aging of society and an **increasing awareness of health**. **Public healthcare systems will restrict their coverage to basic services**, with additional insurance or healthcare services to be paid for by the patient himself. **ICT and biotechnology** will play **key roles** in this sector in the future. Another important and strongly growing field in medicine is **theranostics**, or the **individualization of diagnostics and treatments**. Patients are tested individually to tailor their treatments based on test results and their specific needs

T5.3 LIFE SCIENCES

Text behind animated chart (2/3)

1. WORLD

- > **Biotechnology** is the smallest of the three major Life Sciences markets, with USD 98 billion today but forecast to grow 7.2% annually within the next five years. By 2030, this growth rate is even expected to increase, as biotechnology will have strong influence on several different fields such as primary production, health and industry, contributing a significant share of economic output. **Biotechnology will provide solutions for many of the health and resource-based problems the world will face by 2030**, such as energy, food and water shortages. The innovative potential of biotechnology will increase by 2030 through **convergence with other sciences**, such as **nanotechnology and ICT**. **Tremendous progress** is expected in biotechnology, including new products and services such as regenerative cell therapies, more resistant crops and food with greater nutritional value and improved taste. **Genetic and acquired diseases such as cancer and AIDS** might be cured in the near future by supplementing or replacing defective genes or by bolstering a normal function such as immunity

T5.3 LIFE SCIENCES

Text behind animated chart (3/3)

2. DEVELOPED VS. DEVELOPING COUNTRIES

- > **The gap between healthcare in rich and poor countries is huge but expected to narrow by 2030.** Today, the OECD countries spend USD 3,000 per person per year on healthcare, compared to USD 36 in Africa and Southeast Asia. Concerning differences in disease, people in developing countries increasingly suffer from the same diseases as people in the developed world. **Biotechnology is expected to have a greater impact on developing countries** than on developed ones **by 2030**, as it mainly affects the primary and secondary sectors (agriculture and industry), which are critically important in developing countries
- > The **OECD countries** make up less than 20% of the world's population but **spend 90% of the world's expenditures on healthcare.** They spend on average 9.0% of their GDP on healthcare, ranging from 16% in the United States to 5.9% in Mexico. Public expenditure accounts for 72% of total expenditure, and is therefore far above private spending. However, the **role of private spending will increase** by 2030 as public spending is scaled back to just the basic requirements. **Biotechnology could account for 2.7% of OECD countries' GDP by 2030**, contributing the most to industry and primary production, followed by health applications
- > The **medical situation in the developing countries will improve** over the next 20 years, but the gap to developed countries will remain wide. Some treatments, e.g. gene therapy, are still prohibitively expensive and may it take decades before they are available in developing countries. **Global health partnerships** such as the Global Alliance for Vaccine and Immunization (GAVI) are expected to **increase their efforts by 2030**. Two areas where biotechnology will likely be of great importance for the developing countries are **green (agriculture) and white (industry) biotechnology**, due to increasing population, rising per capita income plus rapid increases in educational levels like in China and India. Global climate change, increasing population and decreasing arable land will raise the question of how to feed everyone. Life Sciences, and biotechnology in particular, will play a key role in these questions in the future, and pave the way for **sustainable agriculture** in the developing countries

T5 CORPORATE ACTIONS (1)

Establish cooperative partnerships & networking

1. ESTABLISH COOPERATIVE PARTNERSHIPS & NETWORKING

- > As technologies and innovations become ever more critical for success and innovation cycles become shorter, companies need to **strengthen their R&D positions**, especially mid-sized ones
- > An ideal way to extend R&D activities without investing heavily is to **establish cooperative partnerships & networks**. Besides the financial benefits, a great advantage lies in the synergies between different fields. Partnerships can be formed with business partners, **universities or research institutes**. And on a **political level**, networking will facilitate business & partnerships, especially in developing countries
- > Another option is to **outsource innovation** to business partners that work together in networks. By distributing innovation along the value chain, companies may **reduce their costs** and usher new products to market faster **by eliminating the bottlenecks** that come with total control



T5 CORPORATE ACTIONS (2)

Watch the latest technology trends

2. WATCH THE LATEST TECHNOLOGY TRENDS

- > To be competitive and attractive to consumers, companies need to become more and more **sensitive to the relevance of technology trends** and implement this awareness within their organizations
- > They need to **identify and go with the right market trends**, which may be with the mainstream or against it, taking Apple as an example. To identify relevant trends, companies need to focus on both **trends in their main business but also in other areas** – new trends often come from other fields, not from one's own
- > Concerning the latest trends in product features or usage, companies need to **widen their perspective** from analyzing trends within their company to external sources such as **social media. Virtual worlds**, where consumers can create their own products, need to be screened to look for the latest trends



T5 CORPORATE ACTIONS (3)

Think divergently & convergently

3. THINK DIVERGENTLY & CONVERGENTLY

- > The creation of innovations demands two opposing skills – the ability to **think convergently and divergently** simultaneously. People in Western cultures are more trained in thinking convergently to find one best solution. However, before bringing together different ideas and aggregating them into a new one, it is essential to first think divergently. That means looking for several **new ideas, new perspectives and more creativity**. Instead of a single answer, you are searching for many different possibilities
- > Companies need to make sure that **divergent thinking is given its due**, as it fosters creativity that is essential for great innovations. Divergent thinking should not be allowed to be banished by time pressure and focus on efficiency in a fast-changing world
- > Therefore, companies need to **make their organizations aware** of the necessity of viewing divergent and convergent thinking as inextricably intertwined, and **implement internal structures** to enable both types of thinking (e.g. room for creativity and employee empowerment)



T5 FOR FURTHER INFORMATION (1)

Most important indicators



TECHNOLOGY DIFFUSION



- > Broadband speed [Gbps]
- > Adaption of new technologies as speed from 5% user to 25% [years]
- > Mobile-only broadband user growth and penetration rate [%; absolute number]
- > Reduction of poverty (due to technology) as share of people living in absolute poverty [%]

INNOVATION



- > Innovations to come [year]
- > Innovation capacity based on qualitative and quantitative data [ranking]
- > Innovation and invention rate compared to developing countries [%]
- > Increase in technological achievement [%]
- > Investment in R&D as share of GDP [%]

LIFE SCIENCES



- > Pharmaceutical market size and growth rates [USD; %]
- > Medical technology market size and growth rates [USD; %]
- > Biotechnology market size and growth rates [USD; %]
- > Spending on healthcare per capita and per GDP [USD; %]
- > Public share of total healthcare expenditure [%]

T5 FOR FURTHER INFORMATION (2)

Most important sources and institutions



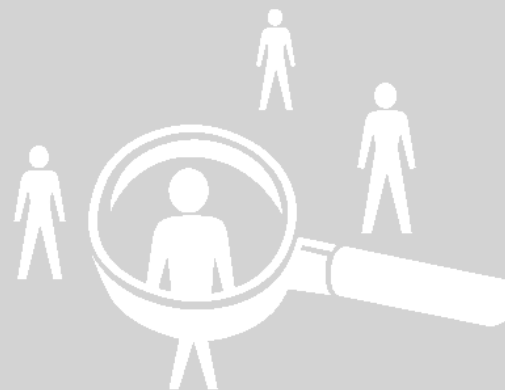
MOST IMPORTANT SOURCES

- > **The World Bank:** Global Economic Prospect – Technology diffusion in the developing world
- > **OECD:** The Bioeconomy to 2030; health data
- > **The Rockefeller Foundation & GBN:** Scenarios for the Future of Technology and International Development
- > **World Future Society:** THE FUTURIST; Timeline for the Future
- > **NIC:** Global Trends 2025 – A transformed world
- > **ZTC:** Technologieprognosen – Internationaler Vergleich 2010
- > **PWC:** Pharma 2020
- > **Cisco:** Cisco Visual Networking Index: Global Mobile Data Traffic
- > **Datamonitor:** Data on biotechnology market
- > **BioWorld and IMS:** Data on pharmaceutical market
- > **BVMed:** Data on medical technology market

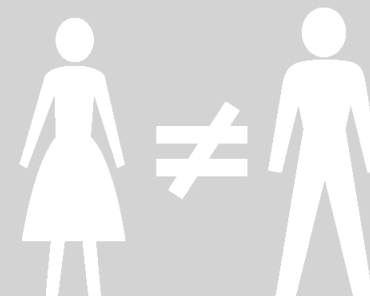
KEY INSTITUTIONS

- > **The World Bank**
- > **OECD:** Organisation for Economic Co-operation and Development
- > **The Rockefeller Foundation**
- > **World Future Society**
- > **NIC:** National Intelligence Council
- > **IMS:** IMS Health
- > **BVMed:** German Federal Association of Medical Technology e.V.

TREND COMPENDIUM 2030



T6 GLOBAL KNOWLEDGE SOCIETY



T6 GLOBAL KNOWLEDGE SOCIETY

Cross-linking of knowledge will increase, gender gaps will narrow and the war for talent will intensify

KNOW-HOW BASE



1. WORLD

The cross-linking of knowledge via the Internet will increase significantly. Internet users will consume an average of 3 gigabytes of data per day

2. DEVELOPED

These regions will still have the highest levels of R&D expenditure

3. DEVELOPING

The illiteracy rate will fall to between 0% and 25% with regional variations

GENDER GAP



1. WORLD

40% of women will have completed secondary education, about 8 percentage points more than today

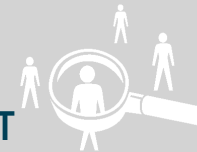
2. DEVELOPED

Gender gaps in employment and wages will continue to narrow

3. DEVELOPING

The literacy gap between men and women in developing regions will fall, but with regional variations

WAR FOR TALENT



1. WORLD

The war for talent will intensify up to 2030, due to the strong increase in the demand for qualified people

2. DEVELOPED

Very limited increase or a decline in the working-age populations, even if they fully use their talent pools

3. DEVELOPING

Limited qualification of the labor force and emigration will lead to skill gaps

CORPORATE ACTION

1. KNOWLEDGE MANAGEMENT

Establish an efficient know-how network

2. ATTRACT WOMEN

Make the work environment more attractive to women

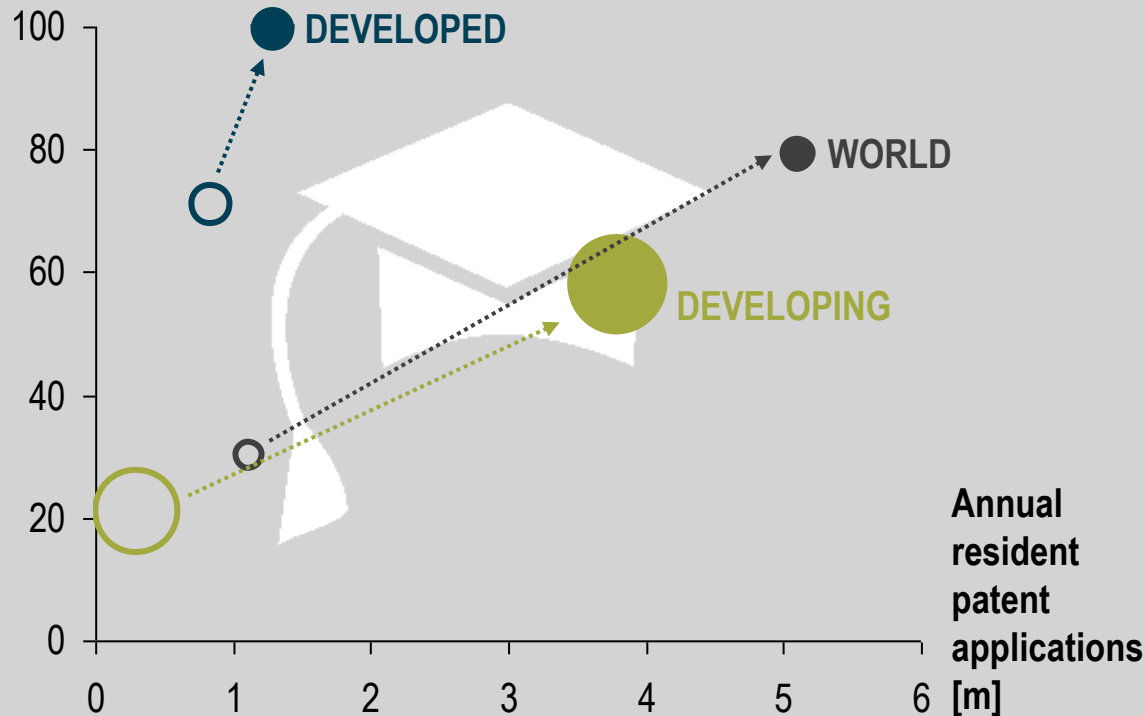
3. GLOBAL HIRING STRATEGY

Attract talent from around the world

T6.1 KNOW-HOW BASE

Global diffusion of knowledge will increase significantly

Internet penetration [%]



○ = Population 2010 ● = Population 2030

Source: UNESCO; ICPD; Euromonitor; ITU; Wipo; Roland Berger estimate

1. WORLD

- > Performance of the global knowledge society will improve over the next twenty years. **The cross-linking of knowledge via the Internet will increase significantly up to 2030.** Some...

2. DEVELOPED VS. DEVELOPING COUNTRIES

- > Up through 2030, the **knowledge gaps** between developed and developing **countries will narrow** and developing countries will catch up significantly in terms of knowledge...

T6.1 KNOW-HOW BASE

Text behind animated chart (1/2)

1. WORLD

- > Performance of the global knowledge society will improve over the next twenty years. **The cross-linking of knowledge via the Internet** will **increase** significantly **up to 2030**. Some experts predict that Internet users will consume an average of 3 gigabytes of data per day by 2030. **The Internet** could already have **5 billion users by 2020**, about 2.9 billion more than today. The build-up of knowledge networks in the Internet has already increased significantly to date. For example, since the online encyclopedia Wikipedia was launched in 2001, the number of English articles has risen to over 3.5 million (as of the beginning of 2011)
- > **Social media** channels such as **Facebook** are also quite **important for knowledge sharing**. Facebook currently has more than **500 million active users**, a number which is likely to increase. By 2030, social media could also replace many of the traditional types of media and will be deeply integrated into corporate IT
- > By 2030, **91% of the world's population** will complete **primary education** compared to 88% today. By 2030, **55%** of the global population will have completed **secondary or higher education**. The current rate is about 50%
- > The number of **global patent applications** and strategic investment in research and development are expected to rise up to 2030. The continuous increase will be mainly driven by strong growth rates in the developing regions. On a global basis, patent applications rose 3.6% per annum between 1995 and 2008. Global **spending on research and development** has increased from USD 729 billion in 2000 to USD 1.157 billion in 2010, i.e. by 4.7% p.a. In 2010, nearly 2.0% of global GDP were spent for research and development

T6.1 KNOW-HOW BASE

Text behind animated chart (2/2)

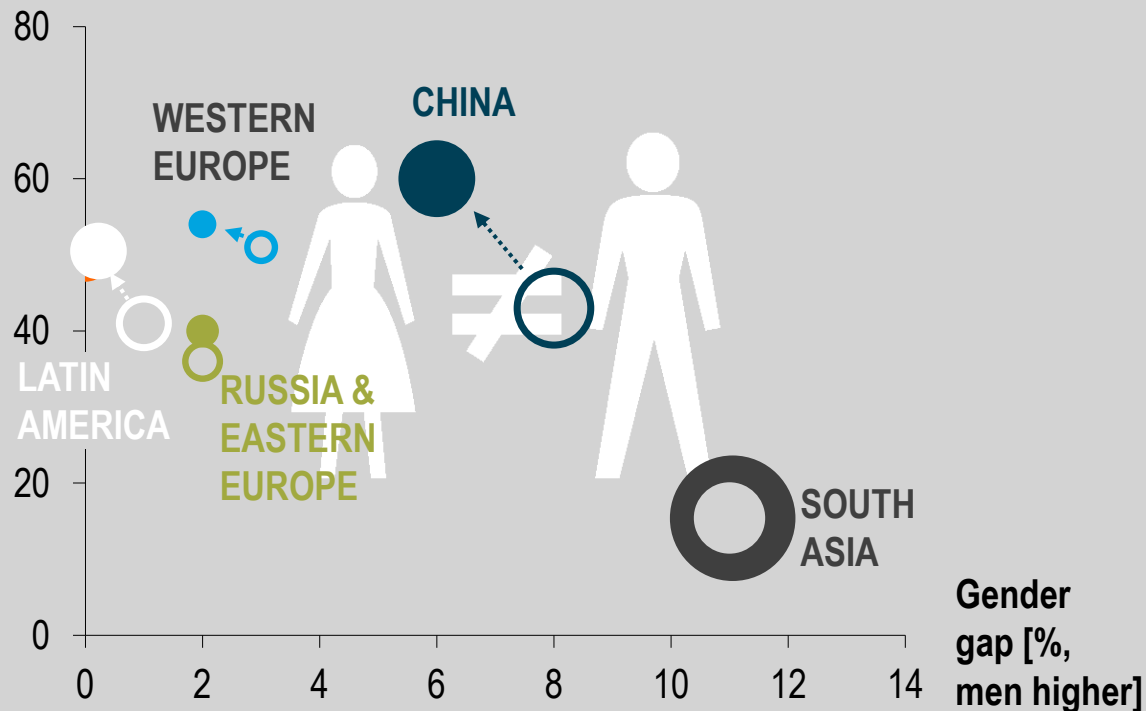
2. DEVELOPED VS. DEVELOPING COUNTRIES

- > Up through 2030, the **knowledge gaps** between developed and developing countries **will narrow** and developing countries will catch up significantly in terms of knowledge spread, education and R&D activity
- > By 2030, **Internet penetration** in the **developed countries** will be about **100%**. The Internet penetration rate has already grown by about 20 percentage points, from 51% in 2005 to 72% in 2010. The number of students in developed countries will continue to expand, in most cases expressed by growth in higher education systems. By 2025 there will be **between 46 and 54 million new students in the OECD countries**. The developed countries will remain the regions with the highest levels of R&D expenditure. Today, the developed regions like Japan, Europe and the United States already account for more than 70% of global R&D expenditure. The number of patent applications will continue to grow at a relatively stable growth rate (comparable to the annual growth rate of 2.2% from 1995 to 2008)
- > Most of the **growth in knowledge linking via the Internet** will come from **developing countries** over the **next 20 years**. From 2005 to 2010 the Internet penetration rate nearly tripled from 7.8% to 21%. A double-digit growth rate is also probable over the next twenty years. Africa in particular will see extraordinary growth rates. The biggest strides in literacy in the run-up to 2030 will be made in the developing countries. The percentage of people who **cannot read or write** still ranges in the developing countries from 15% to almost 50% today, but will **fall to between 0% and 25%** by 2030. These countries are in the **fast lane in terms of R&D intensity**, with superior growth rates in the run-up to 2030. The current growth rates (11% p.a. between 1995 and 2008) will slightly accelerate, driven by an increase in the working-age population in this region, consisting also of a rising number of scientists who file patents (in countries with good educational systems)

T6.2 GENDER GAP

Gender gaps will continue to narrow up – But regional differences will remain

Women with at least secondary education [%]



○ = Population 2010 ● = Population 2030

Source: UN; UNESCO; World Bank; ICPD; Roland Berger estimate

1. WORLD

- > The gender gaps in **education and employment** will continue to **narrow** up to 2030. There will be hardly any difference between men and women in primary education in 2030. By 2030...

2. DEVELOPED VS. DEVELOPING COUNTRIES

- > As we move toward 2030, **more and more women** will have **higher-qualified jobs**, but will **still lag behind men** in both developed and developing countries. So the main...

T6.2 GENDER GAP

Text behind animated chart (1/2)

1. WORLD

- > The gender gaps in **education and employment** will continue to **narrow** up to 2030. There will be hardly any difference between men and women in primary education in 2030. By 2030, differences in secondary education will have fallen moderately, with **48% of men and 40% of women completing secondary education**. In 2000, only 42% of men and only 32% of women over the age of 15 have had 9 or 10 years of formal education
- > Over the next 20 years, **the percentage of women in higher education will increase** only slightly. By 2030, 12% of men will have received tertiary education, compared to only 10% of women
- > Most experts believe the **gender gap in employment will narrow further** but will not completely close, up to 2030. Today women make up approximately 40% of the world's labor force. 53% of adult women were employed in 2008, compared to 52% ten years ago. The employment rate for men was nearly 30 percentage points higher in 2008

T6.2 GENDER GAP

Text behind animated chart (2/2)

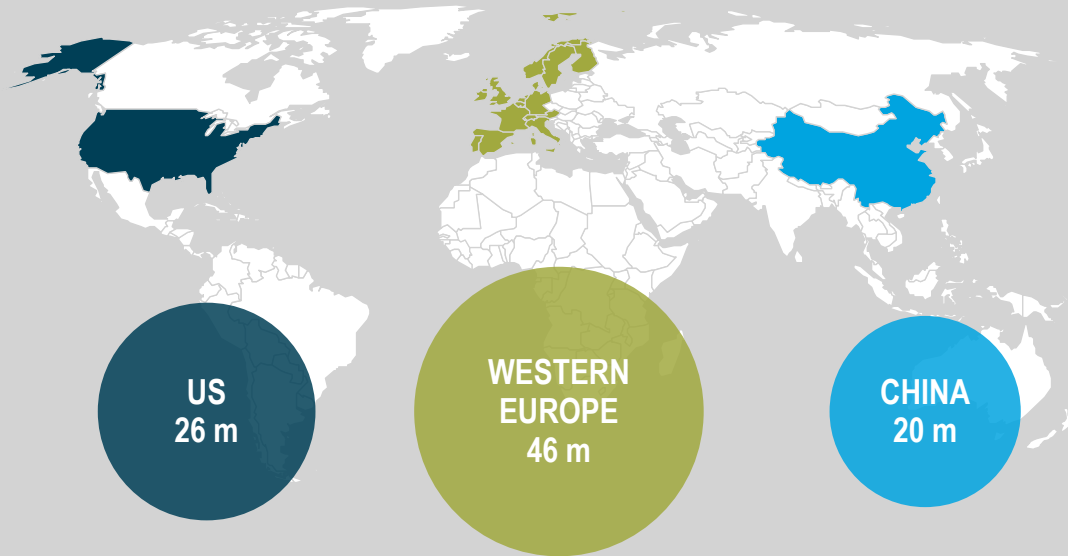
2. DEVELOPED VS. DEVELOPING COUNTRIES

- > As we move toward 2030, **more and more women** will have **higher-qualified jobs**, but will **still lag behind men** in both developed and developing countries. So the main challenge is to translate the female representation in higher education into corresponding representation in the labor market with adapted wage structures and access to management and decision-making positions for women
- > In the **OECD member states** there will be about **1.4 female students for every male student at university** and **1.8 female graduates for each male graduate** in 2025. In some countries (Austria, Canada, Iceland, Norway, the United Kingdom) there could be almost twice as many female students as male. **Wage gaps between women and men** will remain an issue up to 2030. Across the industrialized countries, men's median, full-time earnings were 18% higher than those of women in 2009. The biggest gender wage gaps were in South Korea and Japan, where men earned over 30% more than women; the smallest was in Belgium at 9.3%
- > Up to 2030, the **literacy gap between men and women** in developing regions will **fall, but with regional variations**. The gap will narrow fastest in China, while there will be very little progress in Africa. Nevertheless, there will still be more women than men without education in most of the world, with one exception: the Caribbean. Here, more women than men will be able to read and write in 2030. By 2030, a **rise in the national wealth** of developing countries will **correlate with fewer gender disparities** and rising rates of women in higher education. Currently girls are more likely to never enter primary school than boys. In south and west Asia, only about 87 girls and in sub-Saharan Africa only 93 girls start primary school for every 100 boys. In countries such as Ethiopia, Eritrea, Guinea and Niger, there are fewer than 35 female tertiary students for every 100 male students

T6.3 WAR FOR TALENT

The rising skill shortage in key countries and regions causes a serious war for talent

Number of employees needed by 2030



Source: OECD; WEF; Manpower; PwC; ICPD; Roland Berger estimate

1. WORLD

- > The **war for talent** will intensify up to 2030. Key regions and countries such as Western Europe, the US and China suffer a serious shortage of qualified employees ...

2. DEVELOPED VS. DEVELOPING COUNTRIES

- > The lack of talent will intensify in **both developed and developing countries** up through 2030. In the developed countries, this is caused predominantly by the ...

T6.3 WAR FOR TALENT

Text behind animated chart (1/2)

1. WORLD

- > The **war for talent** will intensify up to 2030. Key regions and countries such as Western Europe, the US and China suffer a serious shortage of qualified employees. Although the worldwide supply of qualified people will increase up through 2030, there is **no way to completely satisfy the even greater demand** for these people. Furthermore, the **talent mismatch** will be an important challenge. Currently, 31% of employers worldwide find it difficult to fill jobs for lack of available talent. This problem will intensify up to 2030, both in developed and developing regions. Serious skill gaps are forecast, for instance in engineering and healthcare
- > By 2030, the globalization of the labor market will trigger a **migration of human capital**. Locations and countries with attractive working and living conditions will see a **"brain gain"** (the immigration of highly qualified people) while other countries will experience a **"brain drain"** (the emigration of highly qualified people)
- > The talent of tomorrow has to work **even more internationally** than the today's employees. As multinationals evolve into global corporations by 2030, the number of short-term and commuting international assignments will grow. The **number of people on international assignments** went up by 25% over the last ten years; a further **50% growth is predicted up to 2020**. While 50% of the employees sent on these assignments in 1998 were executives, their share decreased to 10% in 2009. In 2020, global organizations will place employees in an average of 33 locations, compared to 22 locations in 2009 and 13 in 1998

T6.3 WAR FOR TALENT

Text behind animated chart (2/2)

2. DEVELOPED VS. DEVELOPING COUNTRIES

- > The lack of talent will intensify in **both developed and developing countries** up through 2030. In the developed countries, this is caused predominantly by the **shrinking labor supply**. In the developing countries the reason is the **sharply increasing demand for labor**
- > Due to demographic change, many **developed countries** will experience a **decline in their working-age population**, even if they fully exploit their talent pools. On average, developed economies will lose about EUR 20 billion p.a. per country due to the lack of skilled workers. According to a World Economic Forum report, the **United States will need to add 26 million workers to its talent pool by 2030** to sustain the average economic growth of the last twenty years, while **Western Europe will need 46 million additional employees**. Germany alone will lack 4.4 million people, with about half of that (2.4 million people) required in the academic field, especially in research, consulting, health and education. Although the brain gain (i.e. immigration into developed countries) is likely to rise, there will still be a gap between supply and demand of highly qualified people in 2030
- > Most of the **developing countries** will continue to see significant **growth in their working-age population**. But in several countries with strong GDP growth (e.g. China), the demand for employees will be much higher than the supply (while other developing countries will be confronted with high unemployment rates). Another problem will be the limited employability of the workforce (only 10-20% of graduate students in developing countries are employable by international standards). The **brain gain** of people who were educated and had their first work experience in a developed country and then moved back was limited in the past. For instance, in China, only 25% of the people who have gone overseas to study have returned since 1978. On the other hand, the **brain drain** will remain a problem for some developing regions up to 2030. In sub-Saharan Africa, skilled workers make up only 4% of the total workforce, yet more than 40% of them migrate to richer countries

T6 CORPORATE ACTION (1)

Knowledge Management

1. KNOWLEDGE MANAGEMENT

- > As global knowledge connectivity and generation increases, companies need to establish a system that combines knowledge from different areas in an **efficient, up-to-date network**. Openness to the knowledge of others, knowledge sharing and common knowledge creation will become key targets for enterprises
- > **Social networks, semantic web technologies and open innovations** will play an important role in sharing and generating knowledge. Web 2.0 will advance to a Web 3.0 system with an expanding library of applications and the ability to significantly improve the functionality and usability of search engines



T6 CORPORATE ACTION (2)

Attract women

2. ATTRACT WOMEN

- > At least three developments highlight companies' need and opportunity to **attract qualified female employees**. First, many developed countries will face a **shrinking population** over the next two decades; second, the percentage of **highly educated women** is rising; third, the **knowledge society** is growing
- > Family commitments, especially children, are the main reason why many educated women do not work outside their homes. It is therefore essential for companies to **create working models** that are suitable and attractive to **women**. The main aspects to be considered are **flexibility, career opportunities and child care**
 - **Flexible working conditions** are needed as regards location (home office), working hours and the attitudes of other employees
 - In terms of offering **support** to working mothers, companies can either set up day-care centers or offer slots in external institutions. Sweden is the benchmark, as it has the highest percentage of working mothers
 - **Career opportunities** cannot be linked to working hours, but have to be defined by specific qualitative or quantitative goals. This process needs to be made **transparent** to enable women to plan their careers and take the necessary steps

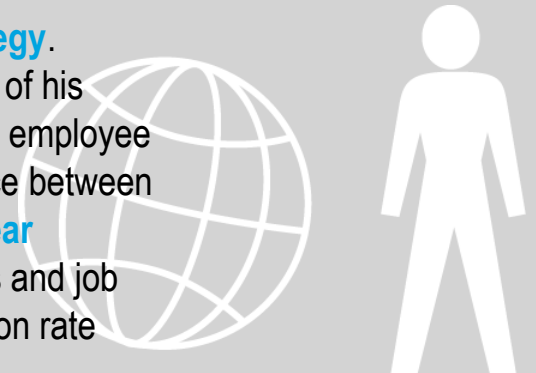


T6 CORPORATE ACTION (3)

Global hiring strategy

3. GLOBAL HIRING STRATEGY

- > As the global knowledge society expands and technological innovations become more important, companies need to hire the best employees. Hiring strategies are not anymore restricted exclusively to their home market; instead, they must **attract talent from all over the world**. As the war for talent intensifies, companies need to **raise their profiles** among potential employees. To do so, they should intensify their **cooperation with universities** and other organizations that attract young professionals. In addition, **strategies for future-based workforce planning** are needed to avoid skill shortages
- > In many cases, **recruiting via social networks** provides a high-quality, low-cost way to recruit high potential candidates
- > The hiring strategy should be **supplemented by an optimized employee retention strategy**. Various estimates suggest that losing a middle manager costs an organization up to 100% of his annual salary. In addition to compensation and benefits, several other factors are critical to employee retention. These **include transparent career development opportunities**, a good balance between **work and private life**, the quality of **supervision**, regular **performance feedback** and **clear communication** of goals, roles and responsibilities. The right fit between personality, skills and job demand and the chance to engage in new projects are also key factors for a strong retention rate



T6 FOR FURTHER INFORMATION (1)

Most important indicators



KNOW-HOW BASE



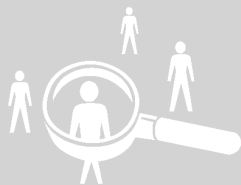
- > Internet penetration [%]
- > Percentage of people with completed primary, secondary and tertiary education [%]
- > Literacy rate [%]
- > Number of resident patent applications [absolute numbers]
- > R&D spending [USD bn; % of GDP]

GENDER GAP



- > Number of women and men with completed primary, secondary and tertiary education [%]
- > Gender Parity Index – GPI [index value]
- > Wage gap [%]
- > Gender gap [%]

WAR FOR TALENT



- > Lack of skilled workers in absolute numbers [people]
- > Employability of the workforce [%]
- > Talent mismatch [%]
- > Absolute number of people on international assignments [people]

T6 FOR FURTHER INFORMATION (2)

Most important sources and institutions



MOST IMPORTANT SOURCES

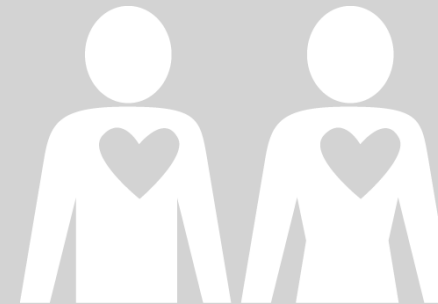
- > **UNESCO:** 2010 Education For All Global Monitoring Report
- > **EFA:** 2010 and 2011 Global Monitoring Reports
- > **WIPO:** World patent statistics
- > **ITU:** Key Internet indicators
- > **UNESCO:** Literacy statistics
- > **UIS:** Various education reports and statistics
- > **WEF, Manpower & BCG:** Stimulating Economies Through Fostering Talent Mobility
- > **Manpower:** World of Work Trends

KEY INSTITUTIONS

- > **UNESCO:** United Nations Educational, Scientific and Cultural Organization
- > **EFA:** UNESCO Education For All Forum
- > **UNITED NATIONS MDG:** Millennium Development Goals (especially nos. 2 and 3)
- > **ICPD:** International Conference on Population and Development
- > **WIPO:** World Intellectual Property Organization



T7 SHARING GLOBAL RESPONSIBILITY



T7 SHARING GLOBAL RESPONSIBILITY

Shift to global cooperation, nonprofit power and philanthropy will advance

SHIFT TO GLOBAL COOPERATION



1. WORLD

Global trend among nations to cooperate and share responsibility will intensify

2. DEVELOPED

Existing partnerships and institutions will have to react and increasingly adapt to the views of developing countries

3. DEVELOPING

The number of economic, trade and social collaborations will increase faster than in developed countries

GROWING POWER OF NGOS



1. WORLD

The number of NGOs will show double-digit growth rates

2. DEVELOPED

The US will remain the forerunner in NGO growth

3. DEVELOPING

Experts see clear signs of dynamic growth for community foundations in Africa, Asia and Latin America

INCREASING PHILANTHROPY



1. WORLD

Philanthropy will grow further on a global level, but the philosophy of giving will change

2. DEVELOPED

Private donations will show continuous growth rates

3. DEVELOPING

The philanthropic sectors in developing countries will differ. In the more open societies (Brazil, India), a new philanthropic culture will be free to flourish

CORPORATE ACTION

1. USE BUSINESS OPPORTUNITIES RESULTING FROM GLOBAL COOPERATION

Optimize global footprint

2. INTRODUCE AN ETHICAL APPROACH TO MANAGEMENT

Focus on all stakeholder needs

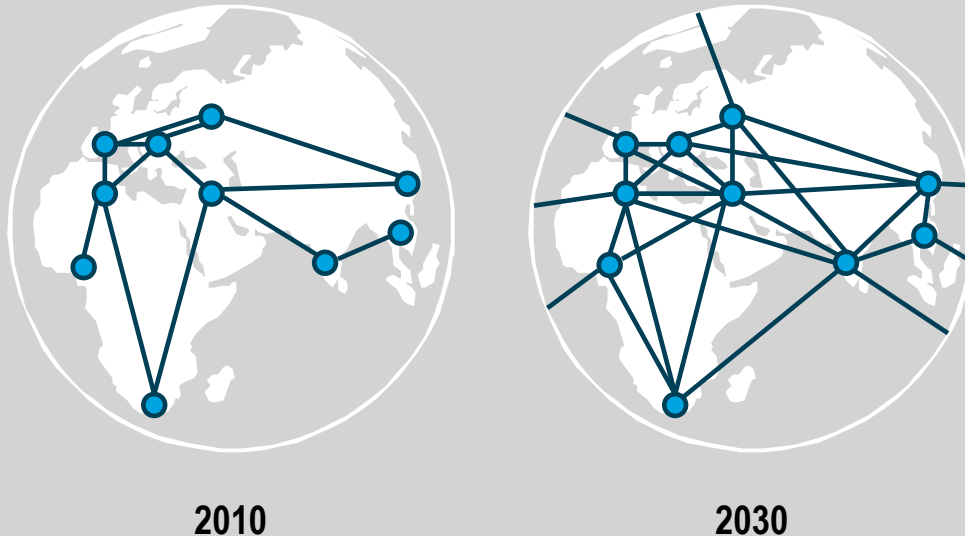
3. OPTIMIZE COOPERATION WITH THE NONPROFIT SECTOR

Benefit from know-how in sustainable management and ecological & social innovation

T7.1 GLOBAL COOPERATION

The number of transnational coalitions and networks will increase significantly

Increasing international collaboration



Source: National Intelligence Council; Federal Agency for Civic Education

1. WORLD

- > Between today and 2030, the world will be characterized by **increasing globalization, greater global complexity and technological advancement**. Future...

2. DEVELOPED VS. DEVELOPING COUNTRIES

- > According to the Report of the National Intelligence Council (NIC), **existing international organizations** such as the UN, WTO, IMF and the World Bank, which have...

T7.1 GLOBAL COOPERATION

Text behind animated chart (1/2)

1. WORLD

- > Between today and 2030, the world will be characterized by **increasing globalization, greater global complexity and technological advancement**. Future problems will include international crises and serious risks of environmental pollution, affecting virtually every country in the world. These developments show how vulnerable the world is and will lead to a **greater awareness of global responsibility**
- > For instance, membership of the World Trade Organization has grown 24% from 124 in 1995 (the founding date) to 153 in 2010. **United Nations Global Compact** (UNGC) is the world's largest corporate citizenship and sustainability initiative. The aim of the initiative is to encourage businesses worldwide to adopt socially responsible and sustainable guidelines, and to report on their implementation. Since its official launch in 2000, it has grown to **more than 8,000 participants, including over 5,300 businesses in 130 countries around the world**
- > In December 2010, 193 countries signed an agreement to combat climate change. The deal, known as the Cancún Agreements, commits all major economies to reducing their greenhouse gas emissions. More and more of the **world's countries** will join economic, political and social **collaborations to share global responsibility by 2030**. However, differing opinions between countries and shifting coalitions of member nations will also persist in the world of 2030

T7.1 GLOBAL COOPERATION

Text behind animated chart (2/2)

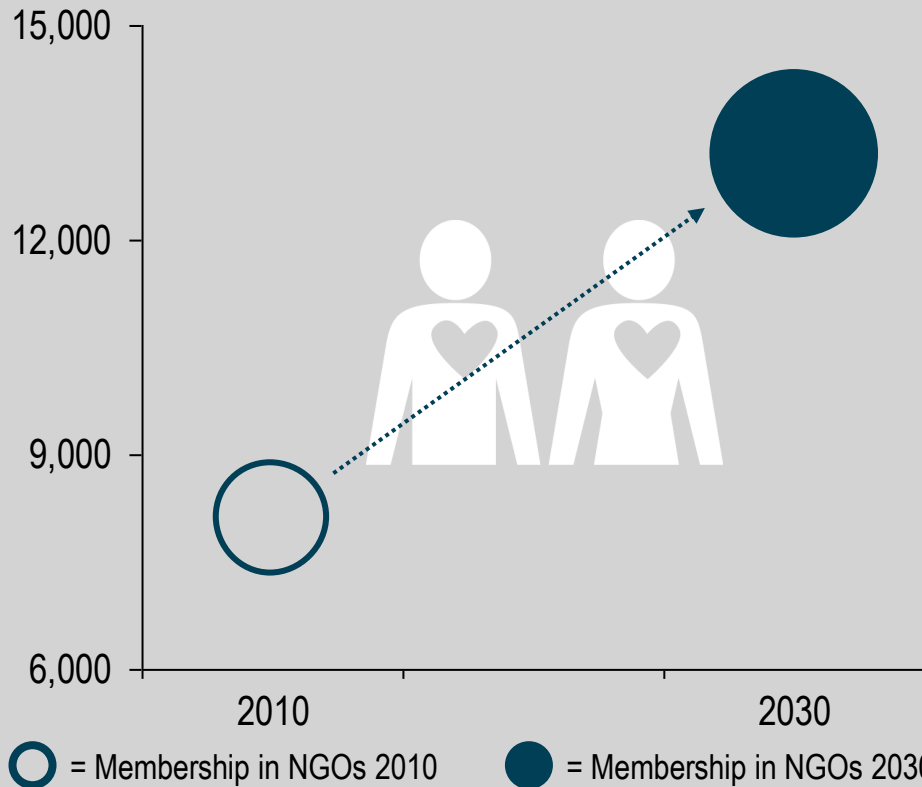
2. DEVELOPED VS. DEVELOPING COUNTRIES

- > According to the Report of the National Intelligence Council (NIC), **existing international organizations** such as the UN, WTO, IMF and the World Bank, which have been influenced primarily by the developed countries up to now, **will have to react and increasingly adapt to the views of developing countries**. The latter's global influence is growing considerably as a result of economic, social and technological advancement. The influence of developed countries is still above average in many international organizations. For instance, developing countries such as China and Russia have only about 2.8% of the votes at the International Bank for Reconstruction and Development (part of the World Bank), compared to the US with 16% or Japan with 8%
- > The **challenge up to 2030 will be to consolidate the different viewpoints of developed and developing countries**. E.g. the G20 promotes open and constructive discussion between industrial and emerging-market countries on key issues related to global economic stability. Collectively, the G20 economies account for 85% of global gross national product, 80% of world trade (including EU intra-trade) and two-thirds of the world population. In 2010, a global **standard on social responsibility** was launched for all kinds of organizations. 90 countries back the new standard, including a strong participation among developing countries

T7.2 POWER OF NGOs

Their global impact will increase significantly by 2030

Number of international NGOs¹⁾
[absolute number]



1) With subsidiaries in at least three different countries

Source: Union of International Associations; Federal Agency for Civic Education; Roland Berger estimation

1. WORLD

- > **Non-government organizations (NGOs)** like Amnesty International, Greenpeace, Worldwide Fund for Nature, Transparency International, Human Rights...

2. DEVELOPED VS. DEVELOPING COUNTRIES

- > As we move **toward 2030, the nonprofit sector will gain in importance in both developed and developing regions.** In the latter, development will depend greatly...

T7.2 POWER OF NGOs

Text behind animated chart (1/2)

1. WORLD

- > **Non-government organizations (NGOs)** like Amnesty International, Greenpeace, Worldwide Fund for Nature, Transparency International, Human Rights Watch and Oxfam will **grow significantly up to 2030**. They will continuously increase the influence of global civil society and **raise awareness for issues such as environmental protection, social justice and human rights**. Low entry costs, low overheads and the capacity of individuals and groups to affiliate with each other using the Internet are facilitating this development. In particular, the global conferences of the United Nations (UN), starting with the Conference on Environment and Development (UNCED) in 1992 in Rio de Janeiro, have given NGOs a new position and greater acceptance
- > For instance, the number of international NGOs has increased 65%, from 4,620 in 1991 to 7,628 in 2007. For the period up to 2030, we expect the growth rate to slow down slightly due to increasing governmental influence on responsibility sharing and the rising number of coalitions between single NGOs. The **membership of Amnesty International has quadrupled** from 700,000 in 1990 to 2.8 million in 2010. **Transparency International**, a global civil-society organization leading the fight against corruption, has advanced to **a global network of more than 90 national chapters** since it was founded in 1993

T7.2 POWER OF NGOs

Text behind animated chart (2/2)

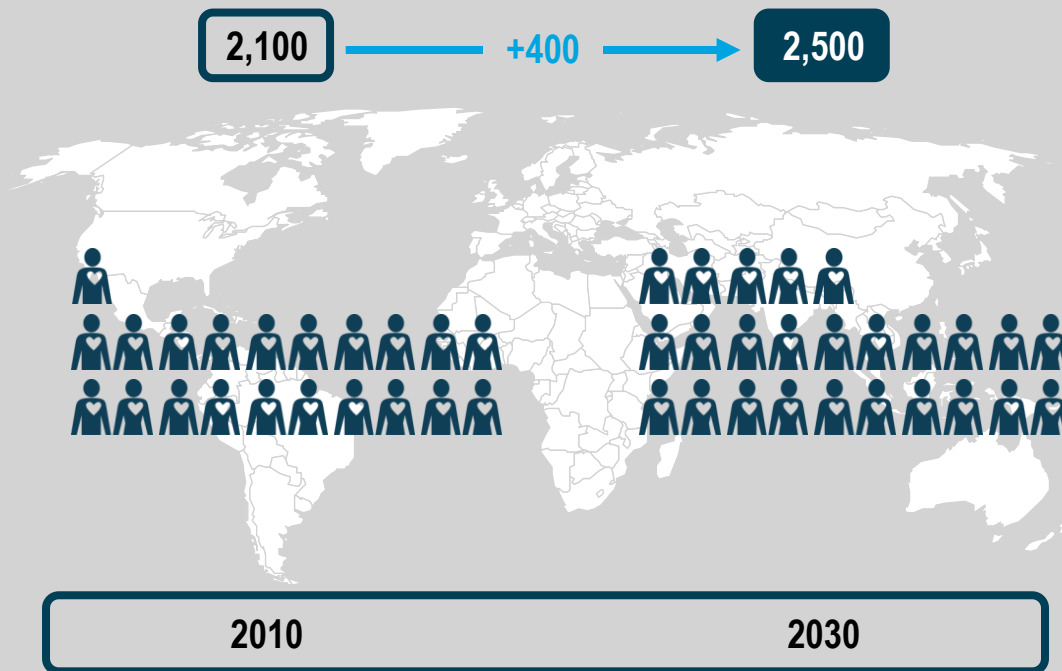
2. DEVELOPED VS. DEVELOPING COUNTRIES

- > As we move **toward 2030, the nonprofit sector will gain in importance in both developed and developing regions**. In the latter, development will depend greatly on the future economic and political background
- > Through 2030, the **NGO landscape in developed regions will show stable growth rates. The forerunner is and will remain the United States** with more than 1.6 million small nonprofit organizations. But **Europe is also on the fast track**. At present there are about 110,000 foundations in Europe; **about 1,000 new foundations are set up every year in Germany alone**. Europe has been especially spectacular as regards the growth of community foundations, a special foundation segment. Community foundations (CFs) such as the Bertelsmann Foundation are instruments of civil society designed to pool donations into a coordinated investment and grant-issuing facility primarily dedicated to social improvement in a given place. At the start of the decade in 2000, there were 103 community foundations in Europe; in 2010, there are now 631 – a sixfold increase in ten years
- > By 2030, the number of **domestic NGOs** will **grow** mainly in **developing regions as democratization, cultural change and wealth increase**. Domestic aid organizations like BRAC (Bangladesh Rural Advancement Committee), Asha (Asian Women's Self-Help Association) or Africare already have considerable influence today. In future, too, organizations will be set up by foreign countries to meet a need for financial aid or to fight for human rights. For instance, the number of community foundations in **Africa and Asia** is still relatively small and most of them are still very young; but experts see clear signs of **dynamic growth in these regions**, and high growth rates are also observable in **Latin America**

T7.3 PHILANTHROPY

Donations will grow further on a global level up to 2030

Number of active donors worldwide [m]



Source: Federal Agency for Civic Education; Hudson Institute; Charities Aid Foundation; Center for Global Prosperity; Roland Berger estimation

1. WORLD

- > **Philanthropy will grow further on a global level up to 2030.** Global donations to Greenpeace increased consistently at the rate of 4% p.a. from 2000 to 2009; donations...

2. DEVELOPED VS. DEVELOPING COUNTRIES

- > The **dependency of developing countries on donations from developed regions** will remain an **important issue up to 2030**, because some of these regions...

T7.3 PHILANTHROPY

Text behind animated chart (1/2)

1. WORLD

- > **Philanthropy will grow further on a global level up to 2030.** Global donations and grants to Greenpeace increased consistently at the rate of 4% p.a. from 2000 to 2009; donations to Amnesty are currently ten times what they were in 1990. Global willingness to donate was not even stopped by the global financial crisis. The Haiti earthquake in 2010 led to USD 1.4 billion in donations to 96 organizations. About 30% of the world's population donates money to a charity every year, so the world will have **about 2.5 billion active philanthropists by 2030**. The growth of philanthropy also has a strongly emotional aspect: there is a strong correlation between giving money and happiness, with a coefficient of about 0.69
- > Between now and **2030, the philosophy of giving will change further – away from conventional philanthropy** (supporting major nonprofit institutions) **to venture and catalytic philanthropy**. Venture philanthropy refers to supporting a social business with financial, intellectual or human capital. In addition, the donors sometimes act also as mentors or consultants for the nonprofits or take positions on their boards. Catalytic philanthropy goes a step further; here the donors want to catalyze a campaign that achieves measurable impact on a social issue they are deeply concerned about. They get personally involved and empower others in a compelling campaign for this topic and create an atmosphere for collaboration and innovation. Financial investments are often supplemented by building alliances, mobilizing stakeholders and conducting research that leads to action and awareness building. Famous examples of catalytic philanthropists are Bill Clinton, former President of the United States; Bill Gates, founder of Microsoft, Inc.; or Thomas Siebel, founder of Siebel Systems, Inc.
- > **Diaspora philanthropy will still be an important trend in 2030.** Immigrants have always sent money home to support their families or local help organizations, but this form of giving has increased significantly in recent years, fueled by the greater global movement of people and aided by formal organizations and new technologies. Experts estimate that diaspora philanthropy generates nearly twice as much money as the official foreign aid that flows from the richer to the poorer countries

T7.3 PHILANTHROPY

Text behind animated chart (2/2)

2. DEVELOPED VS. DEVELOPING COUNTRIES

- > The **dependency of developing countries on donations from developed regions** will remain an **important issue up to 2030**, because some of these regions will still have big financial and social problems they cannot solve alone. But the World Giving Index shows that, based on average levels of financial donations, volunteering and helping strangers, only around half of the 20 most charitable countries are traditionally strong economies. The other half consists of countries from developing regions. By 2030, these developing countries will become even more important
- > **Private donations from developed countries will show strong growth rates up to 2030**. Between 2002 and 2008 private philanthropy flows from OECD donor countries to developing countries already went up nearly tenfold to about USD 53 billion. As a percentage of GDP, the United States has the highest level of charitable giving in the world: nearly twice as high as the UK
- > Up to 2030 many **developing countries** will experience a further **growth of internal philanthropy**. The **philanthropic sectors** in such developing regions as the BRIC **will continue to differ on the basis of cultural traditions, attitudes on charity and government regulation** in the future. In the more open societies of Brazil and India, a new philanthropic culture is free to flourish. In India, philanthropy has a longstanding tradition stemming from religious practices that encourage giving. Nationwide, 40% of all households in India give to charity and some 96% of upper- and middle-class households in urban regions donate money to charitable causes. The more authoritarian regimes of Russia and China will continue trying to inhibit the growth of the philanthropic sector outside of strict government control. Total philanthropy in China amounts to only 0.4% of GDP, compared to 2.1% in the USA

T7 CORPORATE ACTION (1)

Use business opportunities resulting from global cooperation

1. USE BUSINESS OPPORTUNITIES RESULTING FROM GLOBAL COOPERATION

- > Increasing cooperation between nations gives companies a **platform to improve their global footprint**. Collaboration can simplify international trade relations or reverse import duties and local content guidelines. This means better business opportunities for all international companies
- > To remain competitive, enterprises must also **redefine their global footprint**: how and where they add specific types of value. Consequently, they must relocate value-chain links to where specific functions can be executed most efficiently. They must also bundle production and assembly plants, as well as development, design and administration functions. In this process they are integrating each site into a global value network. They should also optimize their networks with local suppliers and customers and establish cooperative R&D relationships
- > To expand international business relations, companies must optimize their **involvement in industrial, ecological or social associations**, determine the potential of additional collaborations (e.g. with fair-trade organizations such as Transfair or social-responsibility initiatives like CSR Europe or Global Compact) and establish new partnerships



T7 CORPORATE ACTION (2)

Introduce an ethical management approach focusing on all stakeholders

2. INTRODUCE AN ETHICAL MANAGEMENT APPROACH FOCUSING ON ALL STAKEHOLDERS

- > Awareness of global responsibility is so strong that social acceptance of business activities cannot be achieved without communicating with stakeholders in a transparent and open dialog. Sustainability and mutual acceptance can only be attained together. **Ethical management considers all groups of stakeholders** (shareholders, creditors, customers, suppliers, employees and environmental organizations)
- > Ethical management integrates three key topics that are ideally combined in a **closely interlinked management approach: corporate governance, corporate responsibility and ethical leadership**. Corporate governance is a set of processes, customs, policies and institutions that affect how a company is directed and managed. Corporate responsibility is a strategic business approach that reconciles economic success with social and ecological success. A focus on ethical leadership, which respects the rights and dignity of others, ensures standards of moral and ethical conduct
- > The approach has several key advantages: it has a **positive effect on risk management and reputation**, strengthens **employer branding** and **employer loyalty, enhances customer satisfaction** and drives **product and technology innovation**



T7 CORPORATE ACTION (3)

Optimize cooperation with the nonprofit sector

3. OPTIMIZE COOPERATION WITH THE NONPROFIT SECTOR

- > Since nonprofit power will be increasing significantly up to 2030, companies should use the **competitive advantage of collaborating with NGOs**. Businesses have always allied with nonprofits in the fields of fundraising and public donations, for the betterment of both the business and the charity
- > Conversely, **a business can benefit a lot from an NGO's know-how, especially in the fields of sustainable management or innovation exchange**. In the US, for example, the World Wide Fund For Nature (WWF) is actively involved in training business executives for sustainability management with its Sustainability Training Program. Using intensive knowledge exchange, companies can develop innovative solutions in the field of green technology together with environmental protection organizations



T7 FOR FURTHER INFORMATION (1)

Most important indicators

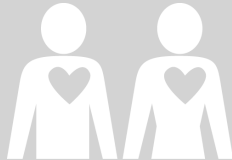


SHIFT TO GLOBAL COOPERATION



- > Members in international coalitions [absolute numbers]
- > Voting rights in international organizations [%]
- > Set up of international social responsibility standards such as ISO 26000

INCREASING NGOs



- > Number of NGOs [absolute numbers]
- > Set up of new foundations [absolute numbers]
- > Development of membership in NGOs [%]

PHILANTHROPY



- > Number of active philanthropists [absolute numbers]
- > Donations as percentage of GDP [%]
- > The Index of Global Philanthropy and Remittances 2010 [index value]
- > The World Giving Index 2010 [index value]

T7 FOR FURTHER INFORMATION (2)

Most important sources and institutions

MOST IMPORTANT SOURCES

- > **Hudson Institute's Center for Global Prosperity:**
The Index of Global Philanthropy and Remittances 2010
- > **Charities Aid Foundation:**
The World Giving Index 2010
- > **Charities Aid Foundation:** International comparisons of charitable giving
- > **Mark R. Kramer, Stanford Social Innovation Review:**
Catalytic Philanthropy
- > **United Nations Global Compact:** Local Network Report 2010
- > **German Organization of Political Education:**
Statistics on globalization
- > **National Intelligence Council:** Global Trends 2025

KEY INSTITUTIONS

- > **Charities and foundations:** E.g. Amnesty International, Greenpeace, World Wide Fund For Nature, Transparency International, Human Rights Watch and Oxfam
- > **Hudson Institute's Center for Global Prosperity**
- > **Charities Aid Foundation**
- > **United Nations Global Compact**

Demographics | Globalization &
Future Markets | Scarcity of
D. OUTLOOK
Resources | Climate Change |
Technology | Knowledge Society |
Global Responsibility

D. OUTLOOK

Life in 2030

D1 HOUSING

> Your high-tech house will be communicative, able to sense your needs, and carbon-neutral

D2 EATING & DRINKING

> Food is not only convenient, delicious and healthy, but it makes you smarter and more focused

D3 LEARNING

> Global superstar teachers will teach your children, while lifelong personalized learning packages keep you up to speed

D4 WORKING

> You conduct virtual meetings from home, and the colleagues you lead have professions unheard of in 2010

D5 TRAVELING

> Your hydrogen car steers itself automatically on the highway, while you plan your next suborbital space trip

D6 COMMUNICATING

> You smile when you think about the old 2010 BlackBerrys and start a discussion with real-time language translation

D7 RELAXING

> You enjoy virtual holidays together with your extended family, or the feeling of being embraced by a hug T-shirt

D1 HOUSING IN 2030

Your high-tech house will be communicative, able to sense your needs, and carbon-neutral

THE COMMUNICATIVE HIGH-TECH HOME



When entering your home in 2030, discreet computerized agents **sense your needs, monitor your environment, and await your spoken instructions**. All electronic devices are **connected**, e.g. a message will appear on the wallpaper while you are **watching your favorite 5D movie** to tell you that your meal is ready. Every room is linked to any **monitored public space**, or you can also see any private spaces for which you have access rights. For working at home, all necessary **high-tech appliances for virtual video conferencing**, etc. are built in as standard features in your house, and in all hotels you stay at

Wardislaw/Kocielecans_Fotolia.com

CARBON-NEUTRAL LIVING



Like all newer buildings, your house will be **carbon-neutral**, meaning that it doesn't use greenhouse gas-emitting fossil fuel energy to operate. Housing is based on **organic, climate-adapted architecture for low-emission, recyclable homes and sustainability compliance**. Since you have installed the latest technology, it is no problem for you to meet the **targets set for water conservation, recycling and solar power usage**

XtraVeganT_Fotolia.com

FLAT-PACKED, ADAPTABLE KIT HOUSES



In your hometown, like in almost any larger city throughout the world, **"kit cities"** have grown enormously over the past years. Accommodating the urban middle class, **fast and modular housing** is offered either through cheaper, pre-fabricated or **flat-packed "kit houses"** or in the form of **instant roof-top add-on units** that maximize existing rooftop space in high-density areas. Overall, more **adaptable and affordable housing** is mass-produced to enable three or more generations to live under one roof, e.g. to facilitate eldercare

Getty Images

D2 EATING & DRINKING IN 2030

Food is not only convenient, delicious and healthy, but it makes you smarter and more focused

MORE THAN NUTRITIOUS



Food and drinks now come from "pharming" – the **convergence of the food and pharmaceutical industries**. Consequently, filling your stomach is but one of several objectives you have in mind when buying food. There are few products anymore that don't **raise your level of concentration, help you fall asleep, or aid digestion**. Drinks that **make your synapses faster** are still quite costly, as are products that stimulate specific parts of your brain, for example to **heighten creativity or math skills**. However, urban gardens with agricultural plots are very much on the rise for people seeking to **re-connect to the traditional food chain**.

Boris Ryzikov_Fotolia.com

HEALTH-CONVENIENT MEALS



If you're in a hurry, you don't need to reach for a burger. Having a **fast, organic, ready-made and healthy** meal is no longer a paradox, since these characteristics are now all **included in one meal**. However, fragmented consumer needs drive the industry, and **novel foods such as artificial meat** are catering to experimental "foodies". **Online shopping will dominate** all purchases with a multiple household **delivery system via eco-friendly vehicles**. Smart media has replaced paper money, as have **self-service checkouts**, rendering cashiers obsolete

Schliemer_Fotolia.com

SMART PACKAGING



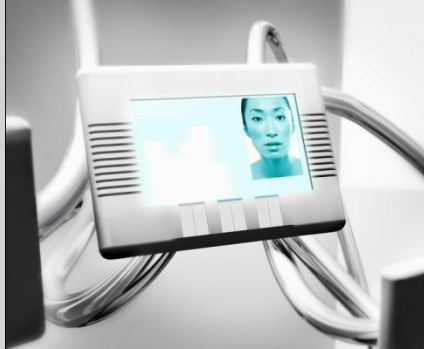
The packaging of the food you buy not only includes **smart RFID chips** for a faster supply chain and automatic check-out, but it also displays all kinds of **new information aside from traditional nutritional value and ingredients: extra functional values** (e.g. increased level of concentration, help in falling asleep, aiding digestion); **carbon and water footprint** (i.e. resources used for production of food item); **food miles** (i.e. distance travelled, local versus imported); and more **health-related indicators** such as time needed to digest, side effects when consumed with medicines, etc

Foodcollection_Geambit/Stockfood

D3 LEARNING IN 2030

Global superstar teachers will teach your children, while lifelong personalized learning packages keep you up to speed

GLOBAL SUPERSTAR TEACHERS



Virtual classes start at a different time every morning, depending on when your children are ready for school. **Global superstar teachers** lecture to classes scattered across the globe, using **telepresence and 3D** technologies. Classes are in all languages as a result of automatic real-time translation. Interactive media links diverse and dispersed groups of educators and students in ad hoc groups to establish **new forms of collective assessments and qualifications**

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PERSONALIZED LIFELONG LEARNING PACKAGES



Virtual learning agents guide you through the massive quantity and different forms of education on offer. To meet your personal needs, the agent will assemble educational offers into a set of functions and roles, producing **lifelong and needs-based learning plans** tailor-made for you. You can of course adjust your personal learning plan at any time, and there will be automatic updates. **Learning experiences** are immersed in and mediated by a learning community as opposed to merely digital, computer-bound and isolating e-learning

Andrea Danti_Fotolia.com

1 CHILD, 2 LAPTOPS, 3 REALITIES



Your children are much more technologically adapt than you, just as they were in 2010. **Fully connected and equipped** to live in a world which is simultaneously real and virtual, your child negotiates reality games and real-life interactions equally well. A **culture of layered realities** has become common and is having a positive impact on learning, involving **cooperative, critical-thinking and problem-solving skills** as found in digital games today. Younger members of society are mentors for their elders with regards to methods of urban and digital survival, computing and networking

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D4 WORKING IN 2030

You conduct virtual meetings from home, and the colleagues you lead have professions unheard of in 2010

VIRTUAL/ FLEXIBLE PROJECT WORK



You usually don't spend more than **5 to 8 hours a week in the office**. **Project work in virtual teams** is flexible, time-efficient and therefore standard, and so at meetings and conferences, most participants are **either at home or traveling**. Being on a plane is no longer an obstacle to work, since you can **securely access your office** from any place on the planet. Nevertheless, even passionate **teleworkers come to their paperless office** at least once a week, to socialize and exchange gossip

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SILVER GIRL POWER



Those in the **65 years+ cohort**, to which you will belong in a couple of years, are more **capable and powerful than ever**, for example by way of **cognitive enhancement, physical augmentation or bionics**, etc. Women in particular pursue their economic interests for longer. The most common picture shows workforce participation rates decreasing for older men and increasing for older women. This means **women will be able to accumulate and control economic resources** in older age and to be better off, even as widows

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TISSUE ENGINEERS AND ECO-SCOUTS



High on the list of today's most attractive professions are: **tissue engineers** (who work with man-made skin and cartilage); **gene programmers**; **"pharmers"** (who produce foodstuffs with therapeutic proteins and intra-food vaccines); **eco-scouts** (who hunt down "Trojan gene" effects in new foods released into the supply chain); **data mining gurus**; **remote do-it-yourself handymen**; **virtual-reality actors** (who interact with you in pay-per-play cyberspace); **narrowcasters** (personalized media providers); **human simulators**; **Internet attachés**; and **knowledge engineers**

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D5 TRAVELING IN 2030

Your hydrogen car steers itself automatically on the highway, while you plan your next suborbital space trip

INTELLIGENT TRANSPORTATION



If you want to go on busy motorways, you have to **book a time slot** or have VIP annual allowances, which **can be traded**. **Car-sharing/-pooling**, but also **inner-city congestion charging** and toll roads are normal. Cars are fully **tracked via black boxes and GPS**, determining **insurance premiums and personal vehicle taxes**. While most cars still work at least partly with traditional fuels, **hydrogen and synthetic fuels** account for an ever increasing share. **Nanotechnology** that keeps all dirt away from your car has posed a serious threat to traditional carwashes

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SHORT FAST TRIPS



Back in 2010, your summer holidays sometimes lasted for weeks. Today, **holiday trips** are much shorter and generally taken more frequently, at least 4-5 times a year. Because of **supersonic and shape-shifting aircrafts**, you don't have to travel more than **five hours to any major destination** on earth if you are prepared to pay a premium. China is still the **number 1 tourist destination**, for both the more affluent **fast-flying holiday-seekers** and the money-saving tourists prepared to fly one or two hours longer

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SUBORBITAL SPACE TRAVEL



Suborbital space travel has become an affordable reality, some 20 years after its first commercial launch. **Multiple international spaceports** cater to this expanding market. You fly 100 km above the surface of the earth and experience **thirty minutes of weightlessness** during the three-hour flight, with four hours' preparation. Among higher-income families, a **space trip has become the most popular Christmas present** in 2030. Due to the many low cost "spacelines" that have entered the market over the past decade, flights can be found for as little as USD 3,500 (2010: USD 100,000). The leading hub is Dubai, catering to the affluent Middle Eastern market

Chris Harvey_Fotolia.com

D6 COMMUNICATING IN 2030

You smile when you think about the old BlackBerrys and start a discussion with real-time language translation

DEVICES, DEVICES, DEVICES



Different from the beginning of your career, there is a **constant conversation with network services and devices** today. **Corporate-style "dashboards"** are now also in the personal domain, making it possible to not only speak with others on the phone, exchange e-mails or participate in virtual conferences, but for **real-time control of all aspects of life**. For example, you can conduct verbal communication via the **semantic web with intelligent digital gurus** that search and find the information you need. Your communication devices can also **arrange social appointments**, supervise domestic appliance and home networks and **add new knowledge files** to personal interests and hobbies

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LANGUAGE ENGINEERING



You don't need to know foreign languages anymore. While **English is still the lingua franca**, language is no longer an obstacle to conversation, since **real-time language translation** service can be accessed anywhere at low cost. This has allowed **minority languages and dialects to flourish** as more time is actually spent conversing in native tongues. As a further consequence, R&D time and effort is now spent on the final linguistic frontier: **human-animal conversation**

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COMMUNICATION NETWORKS



Hierarchy-free, dispersed **"discourse communities"**, e.g. based on shared interests or support groups, allow **one-to-one interconnections among** complex cultural and decision-making systems. Using discussion boards, chat rooms, multi-user online games and other **computer-mediated communication tools**, such communication networks can create statistically unpredictable shifts. In other words, **invisible communication patterns emerge** "under the radar" of corporate decision makers and governments

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D7 RELAXING IN 2030

You enjoy virtual holidays together with your extended family, or the feeling of being embraced by a hug T-shirt

EXTENDED FAMILY



When thinking about your family, you don't think only of your parents and your children. Besides this **lean, core family**, you care about your **peripheral family plus your family of communities** (e.g. communities of practice, discourse communities) **and orbital social structures** which include avatars, social and virtual networks, personal agents/digital gurus and edu-coaches. As all members of a "family" have the same setup, core family time is very limited

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VIRTUAL HOLIDAYS



Knowing that **digital media is sometimes superior to reality**, offering an enriched experience, you spend entire weekends or longer in virtual realities. **Simultaneous or interchangeable use of digital and real conversation** and other media are part of the new user skill set. Computerized agents produce and understand speech well enough to **conduct conversations** with you. In addition, you can **access vast libraries** of documents, art, recorded music, films, personal broadcasts, computer software and other media. All these are controlled and navigated through by a mixture of conversation and visual indexing services

Nimedia_Fotolia.com

JUST RELAX



When there is absolutely nothing you want to do, **you don't do anything**. Domestic technology has freed you from housework, since **functional nanomaterials** are used on self-cleaning windows, in self-cleaning baths and other interior applications to kill germs. A **personal digital agent** excels **at routine lifestyle and social management** – e.g. organizing travel, providing routine medical, financial or legal advice, scheduling social appointments, and supervising domestic appliances and home networks. If you can return home only virtually at night, a **high-tech T-shirt** will ease your evening, simulating the experience of being embraced by a loved one

Kristy Pargacki_Fotolia.com

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