Technological Transformation and EU Industrial Strategy

Key messages
Key messages

1. Use an ecosystem / sector-based analysis to identify enabling technologies and key actions to unlock benefits for strengthening the Single Market and Europe’s place in the world.

2. Digital transformation requires key actions on public policy and regulatory frameworks to unlock technology enablers.

3. Digital transformation of all industries (MNEs, SMEs and start-ups) and of public sector (health care, education and social services) leads to new business models, improved productivity & efficiencies and value for money for all citizens.

4. Technology enables the green transition (decarbonisation, energy efficiency, electrification, green fuels, circularity).

5. Strong competitive European companies are needed to secure Europe’s future - based on leading role in Industrial Digitisation & AI – and to deliver on the twin transitions.

6. ERT Member companies are investing €60 billion a year in R&D, mainly in Europe and are ready to invest even more in conjunction with the right policy actions.
Methodology
Use an ecosystem / sector-based analysis to identify essential technology enablers and key actions to unlock benefits for Europe

Benefits for society: **WHY?**

**Ecosystems**
- HEALTHCARE
- ELECTRONICS/Manufacturing
- ENERGY
- MOBILITY/Transportation
- AGRI-FOOD
  
  Including the costs of not transforming

**EU competitive position versus US & China: **WHAT?**

- Essential technology enablers
  - Micro / Nano electronics
  - Ultra-broadband
  - AI / quantum computing
  - Secure Cloud
  - IoT, Edge
  - Electrification
  - Clean energy
  - Renewables
  - Hydrogen
  - Energy storage
  - Power-to-X

**Key Actions to unlock technology enablers**

**Technological sovereignty & open strategic autonomy, while preserving free markets: **HOW?**

- Industrial Digital Transformation
- Green Deal Transition
- Industrial Policy Framework
- Business Actions
  - ERT Pledges

**Putting implementation in focus:** **TRACK**

- Measuring success (KPIs), like ...
  - Manufacturing growth
  - Intra-EU Trade
  - Industrial R&D
  - 5G Adoption
Manufacturing Industry - Vision for the future
In 2030, Europe will lead the industrial platforms, fully connecting and integrating the virtual and physical world, while creating more sustainable and resilient supply chains

Main transformations:
- Move from mass production to additive manufacturing for more individualised products
- Move from offshoring to near-/on-shoring to increase resilience and driven by access to affordable energy
- Move from chains to circular value chains to reduce resource consumption
- Digital twin of products and manufacturing to reduce time-to-market
- Digitisation of products and services to increase value and utilisation
- Decarbonisation of manufacturing (energy efficiency, electrification, green fuels)

**WHY? Benefits of the transition**
- **Business**: increased productivity, flexibility, competitiveness and growth opportunities
- **Society**: more & better jobs, increased sustainability, more resilient value chains, technologically sovereign economy, stronger competitive position vis-à-vis US & China
- **Citizens**: access to better products & affordable energy, cost reductions, improved health care management, education & social services, and more trust in digitalisation
- **Cost of not transforming**: Technological dependence on other regions, loss of competitiveness & prosperity, continued acceleration of climate change, destruction of European jobs and business fabric (including SMEs), decrease of innovation & new business models

**WHAT? Key technology enablers**
- **Technology enablers**:
  - 5G – for reduced latency and increased capacity
  - IoT – for collection of industrial data
  - AI – for adding intelligence and optimisation of value chains
  - Edge Computing – for local intelligence and optimisation
  - Secure Cloud – for optimisation across value chains
  - Competitive clean energy & low carbon technologies

Current challenges from European perspective:
- Late in 5G roll-out
- No sharing of data across borders
- Lack of investments in AI

There is an opportunity for Europe to lead the industrial platforms to strengthen competitiveness, while creating more sustainable and resilient supply chains.
Manufacturing Industry in 2030

**HOW? Key actions necessary**

- Provide sufficient (co-) funding via the R&D & Innovation framework (Horizon Europe), with a clear focus on AI & key enabling technologies.
- Further develop the “better regulation” agenda, and promote the use of regulatory sandboxes, also at EU-level.
- Ensure a swift and Europe-wide 5G roll out, including for local 5G campus networks.
- Strengthen the European Data Economy and Cloud Infrastructure ecosystem (support for GAIA-X / European Cloud infrastructure and Data Spaces).
- Drive the implementation of Industry 4.0 concepts, starting with “low-hanging fruits” such as the digital nameplate (1).
- Ensure trustworthiness as prerequisite for the digital transformation, e.g. trust in the security of digital solutions and services, trust in AI algorithms; reinforce the European cybersecurity framework, with NLF as a strong basis.
- Consider AI also as an opportunity and not just as threat: avoid rigid legislation that hampers the uptake of AI in the EU.
- Provide for open markets & fair competition (“level playing field”).

**TRACK KPIs to measure success**

- Artificial Intelligence Investments (mainly in B2B domains).
- Industrial & public R&D investments.
- 5G Adoption rate (especially on Manufacturing sites — “local campus networks”).
- Industrial Robots (in Industry / Manufacturing).
- Adoption of key digital technologies such as AI (special focus on SME’s).

(1) Digital provision of mandatory product-related documents through a web-based repository, linked to the product by means of a bar code on the product.
Vision for Europe: Lead the transition to sustainable digital industries

Main transformations:

1. **Technology enables green transition** (decarbonisation, energy efficiency, electrification, green fuels, circularity) and delivery of SDGs
2. **Digital transformation of all industries** (MNEs, SMEs and start-ups) and of public sector (health care, education and social services) leads to new business models, improved productivity & efficiencies and value for money for all citizens
3. **Europe has the best quality of life for “the many”**
   - Delivering the twin transitions underpins Europe’s recovery and ensures long-term prosperity, ‘open strategic autonomy’ & resilience
   - Strong competitive European companies are needed to secure Europe’s future, based on leading role in Industrial Digitisation and Human Centric AI.

**WHY? Benefits of the transition**

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- **Society**: more & better jobs, increased sustainability, more resilient value chains, technologically sovereign economy, stronger competitive position vis-à-vis US & China
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A summary of overarching, essential technology enablers

**WHAT? Main overarching enablers driving the EU’s competitive position**

**Industrial Digital Transformation**
- Ultra-broadband (5G & fibre)
- Leading role in AI & Quantum Computing
- Secure Cloud infrastructure in Europe / GAIA-X
- Leading role in IoT and Edge Computing
- Leading role in Micro / Nano electronics

**Lead Green Transition**
- Leading role in renewable energy (offshore wind, energy distribution, smart grids, advanced solar)
- Innovation leader in clean Hydrogen and Power-to-X
- Electrification
- Energy efficiency technologies & practices
- Energy storage
- Raw materials recyclability (including batteries)
- Microelectronics
- Low carbon alternative products and solutions
- Biotechnology
A summary of overarching, essential technology enablers

**WHAT? Main overarching enablers driving the EU's competitive position**

<table>
<thead>
<tr>
<th>Key technology Enablers</th>
<th>Manufacturing</th>
<th>Health Care</th>
<th>Energy</th>
<th>Transportation</th>
<th>Food &amp; Agri</th>
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<td>Micro / Nano electronics</td>
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<td>Raw materials recyclability</td>
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<td>Artificial Intelligence (AI)</td>
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<td>Big data / AI modeling (digital twins)</td>
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<td>Data / Data Sharing</td>
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<td>Edge Computing</td>
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<td>Digital Health Tools - Telehealth</td>
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<td>Genetics</td>
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<td>Renewable power</td>
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<td>Energy storage</td>
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<td>Decarbonised gas</td>
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<td>Mobility solutions</td>
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<td>Charging and fuel infrastructure</td>
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<td>Batteries</td>
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<td>Large scale Power-to-X for maritime</td>
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<td>Large scale conversion bio waste to fuels</td>
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<td>Port infra safety (new fuels risks)</td>
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<td>Shore-to-Ship green power connection</td>
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<td>Electricity grid edge technologies</td>
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<td>Biotechnology / Gene editing</td>
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<td>Fortification</td>
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<td>Human microbiomics</td>
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<td>Novel foods</td>
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<td>Functional nutrition</td>
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<td>Precision agriculture</td>
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Key Actions on Industrial Digital Transformation
‘Delivering next generation digital infrastructure’

Deliver European framework that attracts private investments in Fibre and 5G roll-out:
• Ensure Next Gen EU funds support fast and competitive roll-out of very high-capacity networks and services, while not crowding out private investments
• Enable wide availability of spectrum without levying excessive fees through spectrum auctions
• Enable in-market consolidation & network sharing
• Create level-playing field for infrastructure & service companies, by using horizontal frameworks instead of sectorial, and by effective supervision & enforcement to address dominant digital platforms
• Limit regulation of access strictly to non-replicable infrastructure

Strengthen European Data Economy & Cloud Infrastructure ecosystem and avoid duplication:
Accelerate – with the private sector in the lead – the European Alliance for Industrial Data & Cloud, GAIA-X, and the creation of an IPCEI

Adopt policies to foster the digital transformation:
• Invest in digital education & skills
• Accelerate digital transformation of SMEs and Public Admin including implementing Industry 4.0 concepts
• Support key technology ecosystems & industries (AI, Data, Cloud, Edge Computing)

Consider (human-centric) AI also as an opportunity and not just as threat:
Adopt a risk-based approach of AI regulation, avoiding rigid legislation that hampers uptake of AI in EU

Ensure confidence in technology as prerequisite for digital transformation:
• Improve security of digital solutions and services
• Create trust in AI algorithms & data-based business models and sharing of healthcare data
• Reinforce European cybersecurity framework, with New Legislative Framework as strong basis
Key Actions on Lead Green Transition
‘Delivering the Green Deal’

**HOW? Key actions necessary**

- Align investments in the recovery with the transition towards climate-neutrality and the achievement of the 2030 targets. Next Gen EU to foster transition to climate neutrality, a digital economy and circularity. Aligning efforts can bolster sustainable economic growth, innovation and job creation.

- A price on carbon is a must to incentivise all actors in the value chain to cut emissions, including per sector how to set an effective carbon price and ensure a global level playing field and European competitiveness.

- Availability of sufficient, clean and cost competitive energy is vital for a successful transition, not least as a decarbonised industry will involve a step-change increase in clean energy demand.

- Digital solutions indispensable to empower Green progress with smart energy distribution, advanced mobility solutions and carbon tracking and monitoring.

- Drive demand for low-carbon products by informing users and by incentives to drive the upscaling of production and creating markets. Public authorities to lead by example as a buyer.
Key Actions on Industrial Policy Frameworks
‘Innovation-friendly environment to accelerate the future’

**HOW? Key actions necessary**

- **Boost strategic investments** in the Industrial Digital Transformation, funding for R&D in key enabling technologies, entrepreneurship & skills development (especially for SMEs & start-ups) through MFF & Next Generation EU

- **Enable scaling up** of new technologies, especially by improving access to equity/venture capital through acceleration & strengthening of the Capital Markets Union

- **Tackle fragmentation & strengthen the Single Market** through removing barriers, applying stricter culture of compliance & enforcement, rejecting protectionism

- **Level Playing Field:** promote open markets & fair competition

- **EU competition policy needs to be modernised** and adopt a global market perspective

- **Provide** (harmonised) fiscal incentives for innovation, e.g. tax credits for R&D

- **Pursue “innovation principle” and “better regulation”, promote use of regulatory sandboxes**

- **Foster education & skills** by means of public-private partnerships and address re/upskilling

- **Improving the overall competitiveness** of European companies and quantitatively benchmarking progress against other geographies
Key Actions from Business Leaders – ERT Pledges
‘Strengthening Europe’s Place in the World’

**HOW? Key actions necessary**

- **Growing investment** – ERT Member companies are investing €60 billion a year in R&D, mainly in Europe and are ready to invest even more in conjunction with the right policy actions.

- **Creating value to society** – ERT Members have signed a pledge to promote inclusion and diversity throughout Europe. ERT will strengthen its interactions with society and develop best practice policies.

- **Furthering the Digital Transformation** – ERT Member companies will accelerate their own digitalisation, data and artificial intelligence strategies.

- **Delivering energy transition and tackling climate change** – ERT Members fully support a climate-neutral Europe by 2050 and the 55% reduction target by 2030, backed by a robust industrial policy. ERT Members will work with policymakers at EU and country level to agree on the policies needed.

- **Supporting trade and commerce** – ERT Member companies will actively support the EU to effectively conduct commercial diplomacy to deliver fair and free trade and inclusive global growth.

- **Developing skills** – ERT companies will significantly increase the business-education partnerships for lifelong learning traineeships, apprenticeships and first employment opportunities and train the current and future workforce with the required skills in digital, automation and artificial intelligence.
**TRACK: Measuring success**

EU needs **Key Performance Indicators (KPIs)** to benchmark global competitiveness

- Strong & competitive companies are needed for the EU to achieve open strategic autonomy and to build up more resilience
- The EU needs to be competitive to be a credible geopolitical actor
- The EU can not succeed the twin transitions when competitiveness is backsliding
- Therefore, international benchmarking - not just ‘intra-EU’ - is key to track the EU’s performance to steer future policy & investment decisions
- Neither the Commission nor the EU Member States can carry full responsibility on reaching targets.
- However, they jointly hold responsibility for monitoring, measuring, adjusting and tackling opportunities

**Recommendations**

- Develop KPIs (and targets for 2030) as part of the update of the Industrial Strategy, on a wide range of horizontal indicators (not just for the eco-systems)
- Publish annual “Competitiveness Reports” that measure EU competitiveness with other geographies
- Discuss these findings within the Competitiveness Council and with stakeholders from the business community
Measuring success KPIs to benchmark global competitiveness

5 key KPIs & accompanying targets (ERT publication):
1. High-growth enterprises in manufacturing -> Increase rate by half from 10% to 15%
2. Intra-EU trade in goods -> Increasing intra-EU goods trade to 25% of GDP
3. Industrial R&D investment -> Outperform EU global economic share
4. 5G adoption rate -> On par with US and China
5. Exports of manufactures -> Equal EU global economic share

Fig. 1: An adapted balanced scorecard approach

Industry Contribution to the EU Economy

Balanced Scorecard on Industrial competitiveness

<table>
<thead>
<tr>
<th>#</th>
<th>Indicator</th>
<th>2030 Target</th>
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<th>Indicator</th>
<th>2030 Target</th>
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<tbody>
<tr>
<td>1</td>
<td>Output Performance</td>
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<td>1</td>
<td>Industry value added</td>
<td>Equal EU global economic share (CMS = 1)</td>
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<td>2</td>
<td>Medium and high tech manufacturing gross value added</td>
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<td>2</td>
<td>Intra-EU trade in goods</td>
<td>Increasing intra-EU goods trade to 25% of GDP</td>
</tr>
<tr>
<td>3</td>
<td>Labour productivity growth in manufacturing</td>
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<td>3</td>
<td>Case of doing business</td>
<td>Rank among the top five economies</td>
</tr>
<tr>
<td>4</td>
<td>High-growth enterprises in manufacturing</td>
<td></td>
<td>4</td>
<td>Industry EV/PU</td>
<td>Reduce economy-wide greenhouse gas emissions by at least 70%</td>
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<tr>
<td>5</td>
<td>Competitors in Fortune Global 500 by revenue</td>
<td></td>
<td>5</td>
<td>Industrial electricity prices</td>
<td>Increase the relative price (electricity) with key competitors</td>
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<tr>
<td>6</td>
<td>Industrial activity</td>
<td></td>
<td>6</td>
<td>Circular material use rate</td>
<td>Reduce the use from 10% to 22%</td>
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<tr>
<td>7</td>
<td>Firms in Domains with a Sustainability Index</td>
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<td>7</td>
<td>Domestic investment</td>
<td>Increase the index score from 44 to 10</td>
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<tr>
<td>8</td>
<td>Internal Processes</td>
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<td>8</td>
<td>Number of industrial robots</td>
<td>Reduce the gap with current leaders</td>
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<tr>
<td>9</td>
<td>Employment</td>
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<td>9</td>
<td>Foreign direct investment</td>
<td>Reduce the gap with current leaders</td>
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<tr>
<td>10</td>
<td>Wages and salaries</td>
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<td>Foreign direct investment</td>
<td>Reduce the gap with current leaders</td>
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<td>11</td>
<td>Fixed investment</td>
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<td>11</td>
<td>Foreign direct investment</td>
<td>Reduce the gap with current leaders</td>
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Global Relationships

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<tr>
<th>#</th>
<th>Indicator</th>
<th>2030 Target</th>
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<tbody>
<tr>
<td>12</td>
<td>Investment rate in industry</td>
<td>Increase rate from 25% to 50%</td>
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<tr>
<td>13</td>
<td>High technology exports</td>
<td>Outperform EU global economic share (CMS = 13)</td>
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<tr>
<td>14</td>
<td>Net exports in recycled raw materials</td>
<td>Recycled exports to EU100</td>
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<tr>
<td>15</td>
<td>Economic openness</td>
<td>Remain the most open large economy</td>
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<tr>
<td>16</td>
<td>Trade in services</td>
<td>Be the largest destination for FDI</td>
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<tr>
<td>17</td>
<td>Investment and Trade in services</td>
<td>Reduce the gap with current leaders</td>
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Special Comittee focus:
- Digital transition
- Labor market transition
- Open strategic autonomy / goal-level paywall

*Note: This is based on the EU’s Sustainable Industry Strategy report.*
Next steps – some suggestions

1. Organise public-private dialogues & ‘deep dives’ on each of these ecosystems, based on a consistent methodology.

2. Accelerate the European Alliance for Industrial Data and Cloud, GAIA-X and creation of an IPCEI.

3. Set international - not just ‘intra-EU’ - benchmarks/KPIs to track performance and to steer future policy & investment decisions.

4. Topic for a next session of this group?

*How to accelerate growth & scaling up of the next generation of leading European enterprises? (availability & focus of R&D, equity, entrepreneurship)*
The European Round Table for Industry (ERT) is a forum that brings together around 60 Chief Executives and Chairs of major multinational companies of European parentage, covering a wide range of industrial and technological sectors. ERT strives for a strong, open and competitive Europe as a driver for inclusive growth and sustainable prosperity.

Companies of ERT Members are situated throughout Europe, with combined revenues exceeding €2 trillion, providing around 5 million direct jobs worldwide – of which half are in Europe – and sustaining millions of indirect jobs. They invest more than €60 billion annually in R&D, largely in Europe.

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