ITALY'S PLAN
INDUSTRIA 4.0
Agenda

- Industry 4.0 in the world
- The Italian way
- "Industria 4.0" national plan
Industry 4.0: The 4th industrial revolution

1° Industrial revolution
- Historical loom
- Through introduction of mechanical production plants using water and steam power
- Late 18th century

2° Industrial revolution
- Mass production and assembly line
- Through division of work
- Early 20th century

3° Industrial revolution
- Automated industrial robot in manufacturing
- Through use of electronics and IT to further automate production
- Early 1970s

4° Industrial revolution
- Connection between physical and digital systems, complex analyses of big data and real-time settings
- Through use of smart machines, inter-connected and connected to internet
- Today and near future
## Industry 4.0: Nine technology drivers

<table>
<thead>
<tr>
<th>Driver</th>
<th>Details</th>
</tr>
</thead>
</table>
| **Advanced Manufacturing Solutions** | - Autonomous, cooperating industrial robots  
- Numerous integrated sensors and standardized interfaces |
| **Additive Manufacturing** | - 3D printing, particularly for spare parts and prototypes  
- Decentralized 3D facilities to reduce transport distances and inventory |
| **Augmented Reality** | - Augmented reality for maintenance, logistics, and all kinds of SOP  
- Display of supporting information, e.g., through glasses |
| **Simulation** | - Simulation of value networks  
- Optimization based on real-time data from intelligent systems |
| **Horizontal/Vertical Integration** | - Cross-company data integration based on data transfer standards  
- Precondition for a fully automated value chain (from supplier to customer, from management to shop floor) |
| **Industrial Internet** | - Network of machines and products  
- Multidirectional communication between networked objects |
| **Cloud** | - Management of huge data volumes in open systems  
- Real-time communication for production systems |
| **Cyber-security** | - Operation in networks and open systems  
- High level of networking between intelligent machines, products, and systems |
| **Big Data and Analytics** | - Full evaluation of available data (e.g., from ERP, SCM, MES, CRM, and machine data)  
- Real-time decision-making support and optimization |
Industry 4.0: Expected benefits

- **Flexibility**: Higher flexibility given by small batches production with the economies of scale of mass production.

- **Speed**: Higher speed from prototyping to mass production using innovative technologies.

- **Productivity**: Increased productivity thanks to lower set-up time and reduced downtimes.

- **Quality**: Improved quality and scrap reduction thanks to real time production monitoring through advanced sensors.

- **Product Competitiveness**: Higher competitiveness of products thanks to additional functionalities enabled by Internet Of Things.
Industry 4.0: European landscape

**UK**

**CATAPULT – High Value Manufacturing**

Strategic plan underpinned by the government and by the University’s Institute For Manufacturing which encompasses universities and industrial players

Main initiatives:
- Project financing and applied research

**France**

**Industrie du Futur**

Central Government steering the process which involves investing in technologies and devising industrial strategies compliant with I4.0 guidelines

Main initiatives:
- Fiscal benefit for private investments
- Facilitated financing for SMEs
- Tax credit for research expenditure
- Project financing including: "Industrie du Futur" and "Invest for the future"

**Germany**

**Industrie 4.0**

Strategic plan shouldered by the federal government and with the involvement of the main firms in the industrial and technology sectors

Main initiatives:
- Project financing and applied research
- Tax incentives bestowed to investments in hi-tech start-ups

**Netherlands**

**Smart Industry**

«A network centric approach» aiming at beefing up the traditional industrial system through the opportunities stemming from the I4.0 strategy, involving: FME\(^2\), TNO\(^3\), Ministry of Economic Affairs, VNO-NCW\(^4\) and Chamber of Commerce

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1. Under approval by the German government
2. FME: is the largest organization in the Netherlands representing employers and businesses in the technological industry; 3. TNO - Netherlands Organization for Applied Scientific Research - is a nonprofit company in the Netherlands that focuses on applied science; 4 VNO-NCW - Confederation of Netherlands Industry and Employers

Source: public data
Multistakeholder steering committee for Industria 4.0

National Steering Committee

- Presidency of the Council of Ministers
- Ministry of Economy and Finance
- Ministry of Economic Development
- Ministry of Education, University and Research
- Ministry of Labour and Social Policy
- Ministry of Agriculture
- Ministry of Environment and Protection of Land and Sea
- Representatives of Regional Governments
- Leading Italian universities and CRUI
- Research centers
- National Promotion Bank
- Association of manufacturing and service companies
- Trade Unions

Note: Steering Committee organization defined according to the report of the X Commissione attività produttive, commercio e turismo on Industria 4.0
"Industria 4.0": The Italian way

Italian industrial sector peculiarities

❌ Few large industrial and ICT private players able to lead Italian manufacturing transformation

❌ Limited number of industry champions able to coordinate the evolution process of value chains

✅ Industrial sector deeply based on Small and Medium enterprises

✅ Key role of illustrious universities and research centers in development and innovation

✅ Strong cultural traits of finished products

Government guidelines

- Operate in a technological neutrality logic
- Implement horizontal actions avoiding vertical or sector-based ones
- Operate on enabling factors
- Steer existing instruments to promote technological leap and productivity
- Coordinate key stakeholders without acting as a controller or decision maker
### Industria 4.0 national plan
2017-2020 Measures

#### Strategic measures

**Innovative investments**
- Stimulate private investments in I4.0 technology drivers
- Increase private expenditure in research & development & innovation
- Expand open innovation relationships between mature companies and high-tech startups

**Skills**
- Spread the I4.0 culture through "Scuola Digitale"\(^1\) and "Alternanza Scuola Lavoro"\(^2\) programs
- Develop I4.0 skills through vocational training, strengthening "Istituti Tecnici Superiori"\(^3\)
- Finance the I4.0 Technological Clusters and Industrial PhDs
- Create Competence Centers and Digital Innovation Hubs

**Enabling Infrastructures**
- Ensure adequate network infrastructure – Ultra Broadband Plan
- Cooperate in the definition of IoT open standards and interoperability criteria

**Governance and awareness**
- Generate interest on I4.0 opportunities and create a shared public-private governance

#### Complementary measures

**Enabling Infrastructures**
- Ensure adequate network infrastructure – Ultra Broadband Plan
- Cooperate in the definition of IoT open standards and interoperability criteria

**Additional support measures**
- Channel finance to support the I4.0 transformation: Private Debt/Equity, VC
- Support Public Guarantee scheme on investments
- Reinforce internationalization of Italian companies
- Strengthen the productivity-salary taxation exchange and decentralized negotiation

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1. Digital classes at primary and secondary schools ; 2. Work-related learning; 3. Italian vocational schools
Source: Steering Committee "Industria 4.0"
Industria 4.0 national plan
2017-2020 Targets

**Strategic measures**

**Innovative investments**
- >10 bn € private investments increase in 2017/18
- +11 bn € R&D&I private expenditure over the ’17-’20 period (exceeding 2% of GDP)
- +2,6 €B volume of early stage investments mobilized over the ’17-’20 period

**Skills**
- 200,000 academic students and 3,000 managers qualified on I4.0 topics
- +100% Doubling students attending vocational schools on I4.0 topics
- ~1,400 Industrial PhDs focused on I4.0 (out of ~5,000 included in NRP1)

**Setup of National Competence Centers**

**Enabling Infrastructures**
- 100% of Italian companies with access to 30 Mbps connectivity within 2020
- 50% of Italian companies with access to 100 Mbps connectivity within 2020
- 6 consortia regarding IoT standards, monitored by Italian representatives

**Complementary measures**

**Additional measures**
- +1 bn € Reform and refinancing of Public Guarantee Fund for 2017
- +1 bn € Support measures on large scale investments focused on I4.0
- +0.1 bn € Strong investment on digital sales chains (Made in Italy plan)

**Setup of National Competence Centers**

1. National Research Plan
Source: Steering Committee Industria 4.0
**Hyper-Depreciation and Super-Depreciation schemes**

### Innovative investments

- **Advanced Manufacturing Solutions**
- **Additive Manufacturing**
- **Augmented Reality**
- **Simulation**
- **Horizontal/Vertical Integration**
- **Industrial Internet**
- **Cloud**
- **Cybersecurity**
- **Big Data and Analytics**

### Advantages

#### Hyper-Depreciation
- Increase of amortization rate for investments in I4.0 technologies

<table>
<thead>
<tr>
<th>As is</th>
<th>To be</th>
</tr>
</thead>
<tbody>
<tr>
<td>140%</td>
<td>250%</td>
</tr>
</tbody>
</table>

#### Super-Depreciation
- 1 year extension of the Super-Depreciation with a flat rate (140%) for all investments, both tangible and intangible (when related to I4.0 technologies)

#### Deadline
- In order to guarantee a broad diffusion of Hyper and Super-Depreciation schemes, the item delivery date is extended to 30/06/18; however, the order and a >20% deposit must be finalize by 31/12/17

*Not only manufacturing, but also in agrifood, bio-based economy and energy efficiency*

*Source: Confindustria; MATTM; MEF; MIPAAF; MISE; R.E TE. Imprese Italia;*
Tax credit for research and development and innovation expenditure

Research and development and innovation expenditure – '17 example

Expenditure R&D 2012  Expenditure R&D 2013  Expenditure R&D 2014  Expenditure R&D 2017

Tax Credit calculation

<table>
<thead>
<tr>
<th></th>
<th>As is</th>
<th>To be</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eligible credit for <em>intramoenia</em> expenditure</td>
<td>25%</td>
<td>50%</td>
</tr>
<tr>
<td>Eligible credit for <em>extramoenia</em> expenditure</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>Maximum tax benefit per taxpayer</td>
<td>5 M€</td>
<td>20 M€</td>
</tr>
</tbody>
</table>

Source: MEF; MISE
Finance in support of I4.0, VC and startups

Initiatives

- 30% tax deduction for investments up to 1 M€ in innovative startups and SMEs
- Enablement of "sponsor" companies to buy fiscal losses of participated startups
- "PIR" – Reduction of capital gain taxes in case of medium/long term investments on listed and unlisted SMEs
- "Acceleratori di impresa" program, financing the establishment and the growth of new companies focused on I4.0 technologies ("CDP")
- Establishment of dedicated investment funds for the industrialization of high-tech ideas and patents ("CDP")

1. Open funds, Pension plans and Insurance plans; 2013 value equal to 1.069 Bn€
Source: CDP; Invitalia; MEF; MISE
Innovative investments: Tangible benefits for enterprises

**Hyper-Depreciation**

**Example:**
1.000.000 € investment in Advanced Manufacturing Solutions

**As Is**
Amortizable value: 140% of the purchase value
→ 5 years tax reduction equal to 96.000€

**To Be**
Amortizable value: 250% of the purchase value
→ 5 years tax reduction equal to 360.000€

**Up to +275%**

**Tax credit for research**

**Example:**
1.000.000 € incremental expenditure
- 800.000 € intramoenia
- 200.000 € extramoenia

**As Is**
Tax credit 300.000 €
(In case of higher expenditure, credit limit = 5.000.000 €)

**To Be**
Tax credit 500.000 €
(In case of higher expenditure, credit limit = 20.000.000 €)

**Up to +300%**

**Finance in support of I4.0, VC and Start-ups**

**Example:**
1.000.000 € investment in innovative start-up

**As Is**
Tax deduction: 19%
Maximum investment per taxpayer: 0,5 €M
→ Tax deduction equal to 95.000 € / year

**To Be**
Tax deduction: 30%
Maximum investment per taxpayer: 1,0 €M
→ Tax deduction equal to 300.000 € / year

**Up to +215%**

Source: MISE
Skills: Digital Innovation Hub and I4.0 Competence Center

### Digital Innovation Hub

**Features:**
- Selected DIH located at Confindustria's and R.E. TE. Imprese Italia's branches
- Contact point between companies, research institutions and public/private investors

**Mission:**
- Create awareness on I4.0 opportunities
- Support in developing innovative investment plans
- Orientation to I4.0 Competence Centers
- Support in accessing to public and private financing solutions/investors
- Interactions with European DIHs

### I4.0 Competence Center

**Features:**
- Few and selected national Competence Center
- Strong involvement of leading Italian universities and large private players
- Support to key stakeholders (e.g. research institutions, startups,...)
- Mission-oriented and focused on facilitating I4.0 transformational projects in all domains
- Appropriate legal and managerial skills

**Mission:**
- I4.0 training and awareness
- Live demos on new technologies and access to I4.0 best practices
- Technical advisory on I4.0 for SMEs
- Launch and acceleration of technological development and innovative projects
- Trial support and "on-site" development of new I4.0 technologies
- Coordination with European CC

Source: MISE; MIUR
**Budget Law:**
Provisions to foster the Italian industry competitiveness

<table>
<thead>
<tr>
<th>Provision</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>Cumulated value (from 2020 to 2027)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Super and hyper depreciation scheme *</td>
<td>0</td>
<td>1.131</td>
<td>1.923</td>
<td>5.702</td>
</tr>
<tr>
<td>R&amp;D Tax credit **</td>
<td>0</td>
<td>727</td>
<td>727</td>
<td>2.001</td>
</tr>
<tr>
<td>Extension of Sabatini law</td>
<td>28</td>
<td>84</td>
<td>112</td>
<td>336</td>
</tr>
<tr>
<td>Guarantee Fund</td>
<td>1.000</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>Financial provisions for growth</td>
<td>9</td>
<td>97</td>
<td>142</td>
<td>1.108</td>
</tr>
<tr>
<td><strong>Of which:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- PIR</td>
<td>9</td>
<td>25</td>
<td>45</td>
<td>479</td>
</tr>
<tr>
<td>- Alienation of start-up losses</td>
<td>0</td>
<td>39</td>
<td>61</td>
<td>352</td>
</tr>
<tr>
<td>- Tax incentives for start-ups and innovative SMEs</td>
<td>0</td>
<td>33</td>
<td>36</td>
<td>278</td>
</tr>
<tr>
<td>Competence Center</td>
<td>20</td>
<td>10</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Productivity salary</td>
<td>211</td>
<td>392</td>
<td>385</td>
<td>1.924</td>
</tr>
<tr>
<td>Made in Italy Plan</td>
<td>100</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td><strong>Total Industria 4.0</strong></td>
<td>1.368</td>
<td>2.441</td>
<td>3.289</td>
<td>11.071</td>
</tr>
<tr>
<td>IRES haircut (from 27.5% to 24%)</td>
<td>3.950</td>
<td>3.950</td>
<td>3.950</td>
<td>3.950 (annually)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>5.318</td>
<td>6.391</td>
<td>7.239</td>
<td></td>
</tr>
</tbody>
</table>

2017
Public finance burden for incentives on investments scheduled in 2017:
- Industria 4.0 ➔ 10.851 +
- IRES ➔ 3.950 =
**Total** 14.801

Overall
Public finance burden for incentives and tax-cut for the entire period:
- Industria 4.0 ➔ 18.169 + (excluding further refinancing of the Guarantee Fund and Made in Italy)
- IRES ➔ 11.850 =
**Total** 30.019

* Super and hyper depreciation scheme is related to investments started in 2017 and finalized by June 2018. However, the public finance burden follows the depreciation scheme which occurs during the 2018 - 2027 period.
** The tax credit is granted from January 1st, 2017 until the entire 2020. The public finance burden materializes from 2018 onwards.
### Awareness

**Blazoning the acquaintance of “Industria 4.0”**

<table>
<thead>
<tr>
<th>Competence Center / DIH</th>
<th>Roadshow I4.0 local/regional level</th>
<th>Assistance to High-potential SMEs</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Pitching and instructing on the latest digital and manufacturing technologies (about how to use it, benefits in term of innovation, productivity, and firm competition,..)</td>
<td>• Training seminars (presentations, video, private tributes,..) in order to increase SMEs’ confidence on digital innovation topics</td>
<td>• One to one support and assistance to high potential SMEs aiming at integrating the I4.0 guidelines in their business process and prompting the industrial conversion</td>
</tr>
<tr>
<td>• Target: Corporate managers mainly from SMEs</td>
<td>• Target: Corporate managers mainly from SMEs</td>
<td>• Target: Top management of SMEs</td>
</tr>
</tbody>
</table>

**National communication plan**

- A national communication plan enforced through the press, web-sites and social media, with the aim of making the industrial sector more keen on the I4.0 concepts and digital innovations thematic
- Target: Industrial firms