Piemonte in industrial transition: the role of innovation clusters

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Surface 25,400 km²  
Population: 4,5 millions  
30k manufacturing SMEs (98,85%); ≈ 80% micro (<10 empl)

Long-standing industrial tradition

Traditional industrial sectors combined with emerging trends and sectors (automotive, aerospace, mechatronics, green chemistry, textile, agrifood, clean tech, life sciences, ICT, ...).

**R&D and innovation key indicators:**

- total R&D expenditure: 2,03% of GDP (*above national average*)
- private R&D expenditure: 1.6% of GDP (*above EU average*)
- EPO patent applications, innovative SMEs, employment and export in medium/high tech technology-intensive manufacturing *above EU average*
Global industries (FCA; CNH; Iveco; Comau; Magneti Marelli; General Motors; VW (Italdesign), Alstom; Thales Alenia Space; Leonardo, Avio Aero (GE Group), Novamont, Ferrero; Lavazza; ... ) together with a number of highly qualified and innovative Medium and small companies

4 universities: Politecnico di Torino; Università degli Studi di Torino; Università degli Studi del Piemonte Orientale; Università degli Studi di Scienze Gastronomiche (Slow Food)

Regional branches of main national research institutes (CNR, ENEA, IIT, INRIM, ...)

Over 200 research centres and 380 laboratories research foundations and research facilities

3 University Start-up Incubators (2i3t, i3p, Ennetre ... 100 enterprises) and other similar public or private initiatives (≈ 100 start up running)

4 main Scientific and technology parks (Environment Park, Bioindustry Park, PST, Proplast)

7 Innovation Clusters (≈ 1500 companies associated)
European Regional Innovation Scoreboard
3rd performing region in Italy after Lazio* and Lombardia
3406 eligible participation
(420 retained)
9.8% of Italy
12.3% success rate

1.405 M€ eligible cost
(160 M€ retained)
10.5% of Italy
11.4 % success rate

Source: APREdati, July 2017
PIEMONTE IN INDUSTRIAL TRANSITION
Overview on regional situation

Strong R&D and industrial competences and deeply rooted value chains (but high number of SMEs not innovating and insufficient level of collaboration of SMEs with education and research organizations)

Employment in medium/high tech technology-intensive manufacturing above EU average (...but also high rate of employment potentially challenged by industrial change)

- Industry 4.0 can have heavy impact on jobs, esp. Artificial Intelligence (impact on a wide range of intermediate job profiles) and Advanced Robotics (impact on jobs in manufacturing)
- Servitization as a potentially disruptive trend for a manufacturing region like Piemonte

High rate of youth unemployment (with polarization between top and very low education levels), and high rate of aged workers with low qualifications

High level of education and training offer, but tertiary educated people below EU average

General issue related to ageing and generational replacement
High level of R&D in business sectors

Total R&D personnel and researchers in business enterprise sector
Percentage of total employment - numerator in full-time equivalent (FTE)
Source: Eurostat
Some key figures

Below average education attainment

Persons with tertiary education (ISCED)
Percentage of active population
Source: Eurostat

<table>
<thead>
<tr>
<th>Year</th>
<th>European Union (current composition)</th>
<th>Piemonte</th>
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<tbody>
<tr>
<td>2012</td>
<td>16.7</td>
<td>29.5</td>
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<tr>
<td>2015</td>
<td>17.9</td>
<td>32.0</td>
</tr>
<tr>
<td>2016</td>
<td>18.4</td>
<td>32.6</td>
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</table>
Some key figures

R&D engagement and innovation diffusion

R&S and innovation in Italian regions
Source: Istat (R&S and CIS survey)

- Piemonte
- Provincia Trento
- Friuli-Venezia Giulia
- Veneto
- Emilia-Romagna
- Toscana
- Lombardia
- Liguria
- Lazio
- Sicilia
- Puglia
- Abruzzo
- Marche
- Sardegna
- Basilicata
- Calabria
- Valle d’Aosta
- Molise (R&S n.a.)
- Umbria (R&S n.a.)
Some key figures

Start ups:
Piemonte 5\textsuperscript{th} Region but very low density quotient

Torino 3\textsuperscript{rd} Province (urban polarization)

Innovative SMEs:
Piemonte 2\textsuperscript{nd} Region

\textit{Fonte: Rapporto Comitato Torino Finanza, 2018}
Impact of automation
Italy: 15% of workers at risk
(18% in Germany, 16% in France)

Piemonte is above national average (16%)
A key impact: job polarisation

Labour market polarisation, selected OECD countries, 1995-2015

Percentage point change in share of total employment

- High skill
- Middle skill
- Low skill

France, United Kingdom, Italy, OECD Average, Germany, United States, Canada, Japan
Relative trend of FTE jobs by qualification level in Piedmont 2008-15 (2008=100)

Medium qualifications better performing (lack of upgrading and polarisation trends).

Fonte: dati SILP, elaborazione ORML Regione Piemonte e IRES Piemonte
IR2 example of investments in automotive sector

**Climatic System**
11 M€ (3 grant with Italian Ministry)

**Lightweight comp**
8.5 M€ (2.5 grant)

**Lightweight seats**
5 M€ (1.5 grant)

**Light system Energy & communication**
5 M€ (1.5 grant)

**Lightweight comp**
10 M€ (3 grant)

**Smart pad**
7.5 M€ (2 grant)

**Electronic system**
6.5 M€ (2 grant)

**Tyres**
6.5 M€ (2 grant)

**Electronic testing**
7.5 M€ (2.5 grant)

**Electrical testing**
7.5 M€ (2.5 grant)

**Electric vehicle**
9 M€ (2.5 grant)

**Battery membranes**
21.5 M€ (6 grant)

**Electric off road vehicle**
14 M€ (4 grant)

**Electric, Hybrid & connected technologies**
150 M€ (50 grant with Italian Ministry)

**New transport vehicle**
6 M€ (2 grant)
New policy models to keep pace of radical changes of economy/society; better integration of labour/training and innovation/growth policies

Increasing SMEs innovation capacity, collaboration with research organizations and use of research infrastructures

Invest in competences: top level competences (e.g. AI) and skills updating of low qualified workers

Create a favourable ecosystem: increase networking and collaboration attitude and stimulate open innovation processes, build on territorial assets to attract investors and support scaling up

Support integration of regional R&D and industrial specializations in European and global value chains
Some insights from OECD

What supports catching up and employment growth

• Diversification
  – Specialised regions more productive, diversified ones grow faster
    Manufacturing important, but tradable services are gaining

• Local strengths
  – Linking investment in skills, FDI, and knowledge from the supply chain
    Taking advantage of opportunities for territorial branding

• Well-functioning cities
  – Home to knowledge-intensive (traded) sectors
    Larger markets can support economic diversity and dynamism
    Agglomeration economies (beyond borders)

• Tradable sectors (that could be traded)
  – Face competition even if they are not traded
    Might overcome market size and institutional constraints
    Avoid economic imbalances from excessive expansion of non-tradables

• Integration across actors and policies
  – Skills development for place-based needs is a shared responsibility
    But skills policies might not be enough: trade shocks vs automation
THE ERDF PROGRAMME
CURRENT POLICIES
Current regional ERDF R&D policies - rationale

Focus on S3 innovation areas and on horizontal trajectories (Smart and Resource efficiency)

Different schemes covering different TRLs

Technology Transfer and collaborative R&D, at regional and interregional level

Support to SMEs innovation processes

Integration of policies
Current regional ERDF R&D policies - rationale

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<thead>
<tr>
<th>TRL</th>
<th>DEFINITION</th>
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<tbody>
<tr>
<td>TRL 1</td>
<td>basic principles observed</td>
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<tr>
<td>TRL 2</td>
<td>technology concept formulated</td>
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<tr>
<td>TRL 3</td>
<td>experimental proof of concept</td>
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<tr>
<td>TRL 4</td>
<td>technology validated in lab</td>
</tr>
<tr>
<td>TRL 5</td>
<td>technology validated in relevant environment</td>
</tr>
<tr>
<td>TRL 6</td>
<td>technology demonstrated in relevant environment</td>
</tr>
<tr>
<td>TRL 7</td>
<td>system prototype demonstration in operational environment</td>
</tr>
<tr>
<td>TRL 8</td>
<td>system complete and qualified</td>
</tr>
<tr>
<td>TRL 9</td>
<td>actual system proven in operational environment</td>
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Overview on regional ERDF policies - Axis I

**Technology Platforms** (large collaborative projects on relevant areas):

**Smart Factory**: 8 projects supported; total investments 78m€, ERDF contribution 34m€

**Life Sciences**: 5 projects supported; total investments 38,7m€, ERDF contribution 19,3m€

**Bioeconomy**: 11 projects submitted, under evaluation

**IR2 - Industrialization of R&D results** (focus on large enterprises and investments):
21 projects supported; total investments in Piemonte 191,3m€, ERDF contribution 47,1m€

**Research Infrastructures**: 13 RI supported, total investments 40m€, ERDF contribution 19,5m€; voucher scheme to be launched

**ERA-NET - Manunet, Incomera and EME schemes**: 23 projects (with 39 regional partners), 5,2m€ ERDF contribution

Scheme to support **Start ups** to be launched soon (10m€ allocation)

... and **INNOVATION CLUSTERS**
Focus on innovation cluster policy

Members
1200 enterprises (mainly SMEs)
Universities and RTO
Training institutions
Funding entities (banks)
Location of Piedmont’s traditional industrial districts

Source: Authors based on ISTAT (2016) and the Italian cluster observatory
2007-2013 period: 12 innovation clusters launched in 2009 (first region in Italy)

2014-2020: revision to better match S3 (currently 7 clusters)

Mission of cluster organizations:
- expand the membership base
- provide high quality innovation services to cluster members
- promote partnerships at national and international levels
- Elaborate research agendas and support the regional policy maker with updated data on technology trends and cluster evolution
- helping cluster members to access regional public funding for collaborative R&I projects

Total fund allocation 2014-2020: 110m€ (including 5,65m€ allocated to direct operational support to cluster organizations)
Focus on innovation cluster policy

Key figures on 2014 - 2020 Calls
(Linea A - Associated Members + Linea B - Potential new members)

Projects supported: 106
Companies supported: 285
Total investments: 68,5m€ (out of which for research contracts: 11m€)
Regional ERDF contribution: 33,25m€

Interclusters projects: 25
(considering only those officially declared)

Classification of projects per transversal thematic areas:
- Eco-innovation (circular economy and resource efficiency): 36
- Industry 4.0: 54
- Health and wellness: 16
Best practice (integrated policies)

Apprenticeship on higher education and research (ESF scheme)

Mandatory on IR2 and Technology Platforms ERDF schemes

Total number of apprentices as of call obligations: 471

Successful beyond call obligations (Merlo +20%, ITT +40%, Comau +40%, Denso +50%, FCA +100%, Michelin +150%)

Scheme applied also to call PRISM-E (SMEs)
PERSPECTIVES
Stakeholder feedback

A Manifesto for an Innovative Europe

Connecting Research & Enterprise

Digitalisation

Sustainability

Values & Collaboration

Completing the Single Market

5G

Clusters of Change

Innovation Hubs

ACORN

Interconnected Ecosystems & Societal Inclusiveness

Women Entrepreneurship

Mentoring

Skills Gap

Digital Apprenticeships

Dual education

Infrastructures

Accelerating Partnerships

Clusters are accelerators of growth & industrial change

There are 3043 strong regional clusters in related industries.

Clusters matter because they...

- account for 54 million jobs;

- are represented in all parts of Europe and have shown resilience during economic crises;

- nurture growth and jobs e.g. 3% higher wages and the 67 700 young, fast growing enterprises in clusters employ more staff (35 compared to 24 outside).

Source: European Commission, European Cluster Panorama 2016, star rating for size, specialisation, productivity and growth.
Towards Joint Cluster Initiatives

- Industry-focused actions guided by joint strategies of specialised SME intermediaries

- Thematically targeted, with cross-regional and cross-sectoral outreach to SMEs

- Channelling scale-up support to groups of SMEs to boost industrial transformation

Building EU value chains, **industrial modernisation** & capacity building

**Skills** upgrading, talent attraction & entrepreneurship acceleration

Boosting internationalisation & access to **global value chains**
Experimental policy action on clusters

- Strengthening clusters role as system integrator
- Rewarding performances on assigned targets
- Industrial transition challenges targeted (e.g. digitalisation, circular economy, skills)
A revised approach for R&D policies

Opening S3: from sectors to transversal drivers

Societal challenges as innovation drivers

Strengthening innovation ecosystem

“Internationalize” S3: interregional value chains
Testing new approaches I

Development of a comprehensive strategy for economic transformation

Broad innovation and inclusive growth building on smart specialisation strategy

Multi-sectoral focusing on jobs, industrial sectors, business models, economy and society as a whole

Addressing globalisation, automation, decarbonisation, emerging and digital technologies, skills and investment
Preliminary takeaways

• Make innovation work for territorial inclusion
• Spend as much time thinking about technology upgrading as patenting
• Develop collective intelligence to address societal challenges
• Strengthen the complementary role of workers in technological change
• Build skills systems around companies rather than the labour market
• Look for the double dividends – green jobs, new services that match the territory
• Focus on value chains rather than industries
Interregional innovation investments

WHAT

Interregional innovation investments through the commercialisation and scaling up of interregional innovation projects having the potential to encourage the development of European value chains ('component 5'). (ETC Art 3.5)

HOW MUCH

11.5 % of ETC Resources (i.e., a total of EUR 970m) for interregional innovation investments (component 5). (ETC Art. 9.2)

HOW

It shall be implemented under direct or indirect management. (ETC Art 16.1)

FOR WHOM

At the initiative of the Commission, the ERDF may support interregional innovation investments, as set out in point 5 of Article 3, bringing together researchers, businesses, civil society and public administrations involved in smart specialisation strategies established at national or regional levels. (ETC Art 61)
VANGUARD INITIATIVE
NEW GROWTH THROUGH SMART SPECIALISATION

ECSEL
Joint Undertaking
Electronic Components and Systems for European Leadership

EFFRA
EUROPEAN FACTORIES OF THE FUTURE RESEARCH ASSOCIATION

Clean Sky

I4MS

EPoSS
European Technology Platform on Smart Systems Integration

Regi*Tex
SMART REGIONAL INVESTMENT IN TEXTILE INNOVATION

ESTHER
Alliance for Global Health Partnerships

BIo-BASED INDUSTRIES
Public-Private Partnership

smartAnythingEverywhere

ECRN
European Chemical Regions Network

EIP-SCC
European Innovation Partnership on Smart Cities and Communities

suschem

European Cluster Collaboration Platform
Thank you

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