CluStrat – Boosting Innovation through new Cluster Concepts in support of emerging Issues and cross-sectoral Themes

CLUSTRAT

Report on the regional potential of Veneto region

EMERGING INDUSTRIES

- Active Aging
- Sustainable Development / Green Economy
- Sustainable / Intelligent Mobility

CROSS-CUTTING ISSUES

- Internationalization
- Technology & Knowledge Transfer
- Gender in Innovation, including diversity aspects

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REGIONE DEL VENETO

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1. Introduction

At the end of 2011 the resident population in the Veneto region fell to 4,853,657 inhabitants, of whom 458,930 are foreign. The dynamics of birth rates, death rates, and migration flows show important changes in the profile, so the age of the population since the Second World War is progressively older. In Veneto Region the proportion of young people is constantly in decline, while in 1951 people under the age of 15 amounted to 28% of the population, the same value now has fallen to 14%; on the contrary, there is a significant increase in the elderly, from 7.7% in 1951 to 20.6% in 2011. The highest percentages of elderly people are found in the provinces of Belluno, Rovigo and Venezia, zones less attractive from an economic point of view, where the more active groups of the population tend to move away to work or study elsewhere.

Between 2000 and 2012, a growing presence in the markets of emerging economies was associated with the gradual decline of specialisation to the EU area. In fact, the contribution to Veneto export growth in the last twelve years was still closely related to sales to mature markets - in the period in question, about 55% of new export generated can be attributed to the EU markets - however, the markets of the new emerging economies recorded the highest average growth rates, with peaks in central Asia (+13.2%), Eastern Europe (+8.2%) and the Middle East (+6.5%).

Greater propensity to serve the more dynamic markets is associated with placement on the medium-high range of exported products, especially with regards to precision mechanics and advanced manufacture - for many years one of the flagships of high-tech regional production. By observing the dynamic of export in the manufacturing sector and aggregating the basic sectors into classes based on the technological content of the goods, the sector of goods with medium-high technological content has become the most representative of regional export, absorbing 39% of the entire value of foreign sales. The increase in export of this type of goods significantly affected mechanical sector products, electrical appliances and the optics industry. The other component of intermediate content goods has also increased: the share of export of the medium-low technological content goods sector increased from 15.9% in 2000 to 19.2% in 2012. This sector, boosted by the export of metal machining, contributed to the increase of regional export in the last twelve years with a share a little higher than 30%, recording an annual growth rate equal to 4.2%. The field of observation of the medium-high level goods aside from the food, clothing-home textiles, footwear and furniture sectors, also include two sectors that are particularly important to the Veneto economy: eyewear and goldsmiths-jewellery.

In a territorial comparison with the other regions in Italy, Veneto had the highest development of all except during the crisis period when it experience a bigger decline compared to the other economically strong regions of the North, such as Lombardy and Emilia Romagna, perhaps due to its economy which still strongly relied on manufacture and international trade, thus it was more affected by the global recession. Despite this, Veneto recorded an added value in the decade a little lower than the national average, thus proving to have a positive local component, behind which lies a stable productive system fuelling a sign of strong productivity in the area.

Starting from 2008 the Italian economy is going through a phase of profound difficulty: since the beginning of the crisis, Italy's GDP has fallen by 7 percentage points and the number of employed by 600,000 units.

The Veneto Region was also affected by the recession in a similar manner: in 2012 the percentage decrease -2.3% of GDP is only slightly better than the national -2.4 %. 2013 will represent a year in stagnation and the growth predicted for 2014, will be not more + 0.9%. Despite economic difficulties, Veneto remains the third region in Italy for wealth production, after Lombardy and Lazio: 9.4 % of the Gross Domestic Product is generated in Veneto. The GDP per Veneto inhabitant estimated in 2012 was around 29,600 €, 15 % higher than the national value. However, we are far from pre-crisis values, according to 2014 estimates Veneto's GDP could reach 130,079 million €, i.e. return to 2003 levels. In 2014, GDP per inhabitant, while maintaining above the Italian average, is predicted be similar to 1995 values, almost 20 years earlier.

Research is a multiplier of productivity and as such it is a strategic lever essential for kick-starting mature economies towards recovery. An analysis conducted by the European Commission showed that despite the ongoing financial crisis, large EU-based businesses continue to use R&D to maintain their competitive advantage: investments in R&D increased by 9% in 2011, compared to 6.1% in 2010. The figures relative to the increase in R&D in 2011 are mostly related to the automotive industry (growth equal to 16.2%), which represents the biggest growth in investments in R&D in the EU (25%). The European Union is thus gradually going ahead towards its own goal, to invest 3% of GDP in R&D: in 2010 expenditure in R&D of the Union reached 2.01%.

In Italy, in 2010, 1.26% of Gross Domestic Product was intended for R&D, a value that led our country closer to the national objective fixed for 2020, equal to 1.53%; in Veneto the effects of the crisis were felt by this sector: universities and public institutions (whose contribution represents 8% of total expenditure) have cut activities deemed additional to minimum standards more so than businesses, and have therefore reduced spending on research, (while the private sector has maintained a nearly constant level of investment, -0,2%). The incidence of spending of the GDP in Veneto in 2010 was equal to 1.04%, slightly lower than the year 2009, 1.08%: in financial terms it amounts to 1.505 million € and ranks fifth among the Italian regions after Lombardia, Lazio, Piemonte and Emilia-Romagna. Overall in Veneto, in full-time equivalents, there are 21,326 employees working in R&D, which is equivalent to 4.3 out of every 1,000 inhabitants in relation to the whole population, a value a little higher than the national average of 3.7.

The differentiation in business results seems to be a consequence of business size: where small businesses (10 to 19 employees) suffered in the 2005-2010 time period, recording negative average annual changes both in employment and in terms of profitability, medium-sized businesses tended to maintain their status, while the larger ones greatly improved. Businesses with a number of employees between 50 and 249 showed a mutual proportional growth in profitability and employment, while those with over 250 employees further enhanced employment numbers. The highest performing businesses were medium to large sized; they were almost 3,000 (20.7 % of the businesses we observed) and amounted for 66.6 % of all employees in our set of businesses (2010 data). Overall, businesses that engaged in research and development and operated abroad showed consistent improvement in profitability and good employment growth.

The Veneto industrial system still remains an important backbone in terms of the labour force as well as wealth production boosted by the international trade of goods produced in Veneto. Furthermore, it should also be noted that the service sector, in addition to the large component related to tourism, is mainly composed of businesses that operate in services to support industry.

Being a region with such a strong international vocation, it has become important for Veneto to follow the recommendations of the European Commission identified through the flagship initiative on industry that promotes an *'integrated industrial policy for the globalisation era'*. Such policy should improve the access to funding, strengthening and developing the single market, actively defending the rights of intellectual policy, improving infrastructure, activating new industrial innovation policies, regulating international trade and agreements and ensuring access to raw materials and critically important products; include environmental sustainability, thus addressing the issues of energy-intense industries, as well as social sustainability, with the expansion of the business' social responsibility.

The agricultural sector is undergoing slow but inexorable changes, with the progressive disappearance of small, less competitive farms and a timid emergence of more business-like and specialised agricultural holdings. The Veneto's operators thus play a dual role, one of redistribution over the regional territory and across northern Italy, and one of re-launching and sorting for foreign markets, exploiting the traffic corridors heading north and east: these peculiarities have led the region to hold some records in agri-food export, firstly wine which in 2012 broke every record in terms of value, with over 1.4 billion €.

Furthermore, Veneto's agri-food operators also contribute to enhancing tourism, for example, the *'Strade del vino e dei prodotti tipici'* (Roads of Wine and Typical Products), so - regardless of the unfavourable crisis period - in 2011 Veneto tourism recorded record numbers and in 2012, the great potential of the Veneto tourist supply enabled the region to maintain the record flow of visitors, totalling 15.8 million arrivals (+0.3%).

1.2. Cluster landscape

The regional law n.8/2003, modified with law no. 5/2006 marked a turning point in the concept of industrial district, emphasizing the fact that a "production district" may derive not only from a historical legacy but also from an multistakeholders project in an area, whatever its size. The latest available data of the Italian Observatory of Districts (2011), Veneto region recognizes 28 districts, out of which 24 are listed below:

Artistic Furniture (Bassano)	Artistic Glass (Murano)
Classic furniture	Fashion footwear
Meta-districts Wood and Furniture	Fashion (Verona)
Ceramics, porcelain and glass	Sportsystem (Montebelluna)
Marble and stones (Verona)	Food Metadistrict
Eyewear (Belluno)	Wine (Conegliano Valdobbiadene)
Jewellery (Vicenza)	Fisheries (Rovigo)
Tanning (Vicenza province)	Cheese
Advanced ICT	Lighting
Renewable energies (Belluno)	Eco-building
Termo-mechanics	Conditioning and Industrial Cooling
Meta-district Mechatronics and Innovative Mechanical technologies	Metadistrict Cultural and environmental heritage

According to the 2011 Observatory data, presented in March 2013, the districts group almost 89.600 companies (20% - out of a total 450.299), 596.300 employed (27% - out of a total 2.138.000) and exports reach 45.070 million Euros.

Currently (2013) the law is under revision, and a transition toward regional networks of innovation and recognition of cross-sector companies aggregations has been proposed.

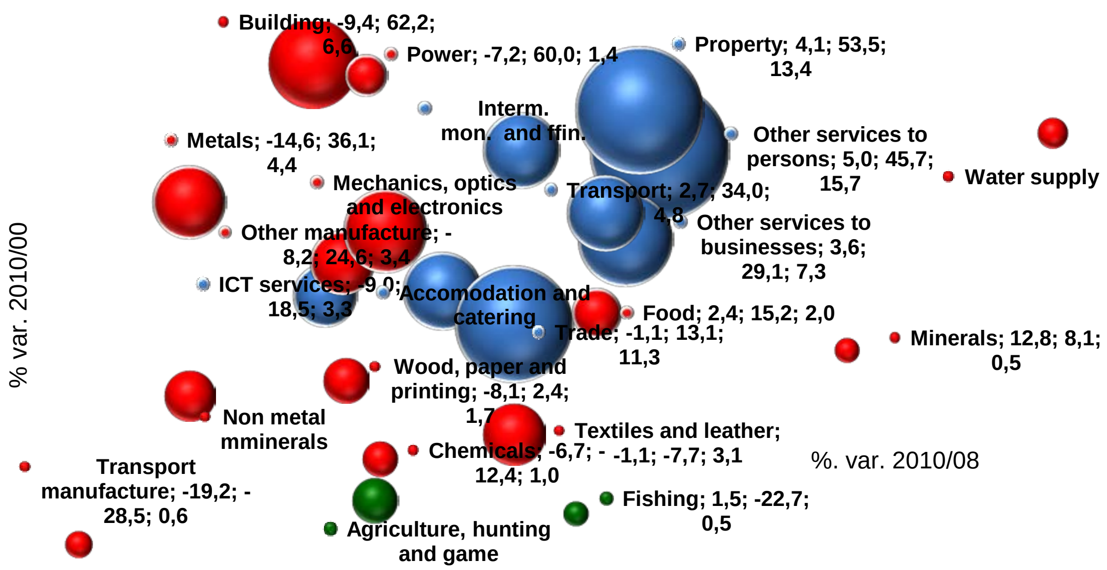
2. Emerging Industries

The region is currently undergoing a process of re-definition of its strategic position at national, EU and international level. The economic structure shows a majority of SMEs and a limited impact of international corporations.

The service sector continues to play a driving role for Veneto economy; the services to businesses in fact represent over 54% of the regional production system (over 65%

excluding the agricultural sector). The businesses that suffered the most from the recession in 2009-2010 are definitely manufacturing businesses, -1.9%, with only exception of the food industry, followed by those operating within the building industry which fell by 1.7%. The transport sector is next with a decrease of -1.8%, followed by trade, -0.2%. The other sectors have kept increasing, especially the 'services to businesses' (+1.9% in the three year period), businesses operating within the voluntary sector 'social and personal services' (+1.5%), those that work within tourism, 'hotels and restaurants' (+1.4%) and the banks and financial institutes (+1.2%).

Fig. 1 - 2010/08 percentage variation and 2010/00 percentage variation of added value per sector of activity and share of sectors out of the total added value. Veneto - Year 2010(*)



(*) The size of the bubble represents the 2010 share of the sectors out of the total of added value. Source: processing by the Veneto Region - Directorate of the Regional Statistical System on Istat data.

Veneto manufacture has changed over time: since the mid-2000s it has experienced a differentiation in production activities, with changes in the relative weight of the sectors, in line with the transformation process of Veneto production which sees some traditional sectors making way for new sectors with higher technological and knowledge content. The service sector remained strategic: the high knowledge content service sector in recent years has been approaching a higher level of active businesses at the expense of other sectors: in Veneto the proportion of such businesses in 2005 was 11.8%, increasing to almost 14% in 2011.

Although no comprehensive dataset is available for the region concerning Key Enabling Technologies (including Photonics, Nanotechnology, Industrial Biotechnology, Advanced materials, Micro/Nanoelectronics and Advanced Manufacturing), the report prepared for the

DG Enterprise and Industry in 2012 shows Advanced manufacturing as an area where the country is on the production frontier of patent and trade performance.

The most important traditional industries are food, wood and furniture, leather and footwear, textiles and clothing, jewelry, but also chemistry, metal-mechanical and electronics. The 2008 crisis effects showed how the survival rate of manufacturing companies is related to their dimension (medium to large sized) and to their ability to export and internationalise.

A growing trend of manufacturing activities is the progressive shift from B2B (business to business) to B2C (business to consumer) activity, thus creating the need for product and service restructuring.

The three emerging industries, Green Economy, Active Ageing and Sustainable Mobility plays different roles in the region and are also differently perceived by the stakeholders.

2.1 Green Economy

The green economy is identified as a driver to re-design product and services, to reduce costs connected to the use of materials and energy (energy saving, energy storage and waste recycling)

The green perspective is perceived as strategic to the innovation process and to foster research and development activity, although there are major difficulties in identifying the real value of R&D, as only materials and technology costs are currently included while staff is excluded.

Companies and research centres underline the need for a rationalization of existing experiences, the definition of strategic objectives for development and the improvement of coordination among stakeholders.

Patents from 2010 registered in Veneto are mainly focused on energy saving, waste recycling and sustainable energy production

The most dynamic components (companies and research centers) in each sector intensively invested in green economy and sustainable manufacturing, thus showing its high relevance and scalability opportunities offered by the related emerging industries. The main areas of application and industry branches are:

- *Sustainable Living*: integration of emerging and traditional industries to ensure sustainable housing styles;
- *Green Manufacturing*: sustainable materials, energy storage and energy management, waste treatment;
- *Energy efficiency* to ensure industrial and household energy efficiency;

- *Renewable energy*: Photovoltaic.

2.2 Active ageing

Active ageing is perceived as a growing opportunity in different sectors and clusters, from footwear to furniture and building. The term “social innovation”, partially related to the concept of active ageing is increasingly spreading among stakeholders, and the ICT district is promoting a regional network of innovation among companies, universities and research centers as a preparatory activity toward

Domotics, fuelled by innovative medium companies such as Came, Nice, Vimar, is the sector most involved in the development of new products and services to improve quality of life of ageing and disable population. According to the CLUSTRAT qualitative research, an enhanced cooperation among cross-sector companies could foster the development of all-inclusive products, ideally perceived as an integrated service. The district policy shall therefore be revised to ensure such a cooperation and integrate knowledge transfer among stakeholders.

Active ageing, with particular regard to silver economy’s growth potential, shows high relevance within three main areas of application:

- *Living* (Ambient Assisted Living): integration of emerging and traditional industries to improve living experience of elderly and impaired people such as: domotics, design, furniture, building;
- *Wellness Tourism*: spa industry (tourism and specific medical treatment toward local and international elderly users, integrated with natural and historical heritage, slow food);
- *Health care*: e-healthcare; biomedical apparels; biotechnology research.

2.3 Sustainable mobility

Sustainable /Smart mobility for citizens in Veneto is mainly connected to urban planning and smart cities concepts, therefore, although strategic, it has a low relevance in the regional cluster development.

Therefore sustainable mobility has not yet been connected to a specific cluster nor it has been clearly understood its potential as new services creation. Further actions shall sensitize and define its potential in order to ensure its full development. The industry side underlined the need for a wider integration with the main European and global routes.

Framework agreements for the infrastructural and harbor development are currently under definition.

The potential main areas of application might be:

- Shipbuilding – informal coastal cluster;
- Aeronautic;
- Integrated transport systems.

A test of the integration of sustainable mobility and green economy is represented by the Hydrogen Park initiative, represented by a consortium of public institutions and research centers which ultimately brought to the development of an hydrogen-fuelled waterbus, to foster the mobility in Venice historical center.

As a transversal remark, the regional strengths lie in the impressive mass of Small and Medium sized companies already connected to the CLUSTRAT issues, as well as the remarkable number of initiatives launched also, but not exclusively, in cooperation with the districts. Additionally, the current revision of the regional law about districts is a striking opportunity to set a shared vision, ensure coordination against fragmentation, boost a cohesive approach toward innovation, employment and sustainability and strive to meet the objectives of the European Strategy 2020.

An experience coherent with the CLUSTRAT strategy is the opportunity offered by the Sustainable Building district, as the actions undertaken answer to the new challenges connected to living in a sustainable and healthy way, and include domotics and energy saving technologies. Sustainable living includes also the design and / or restructuring of existing houses in consideration of an increasingly older population, thus integrating green economy and active ageing issues. Sustainable mobility is not directly connected to the districts recognized by the regional law and its funding policy, although the issue is strategic in a region where the territorial connectivity is often am infrastructural weakness.

3. Cross-cutting Issues

3.1 Knowledge and technology transfer

The knowledge and technology transfer issue is a major policy priority, generating a relevant number of research and innovation initiatives funded at regional and national level. Consequently, a relevant number of players and institutions are involved in the transfer, leaded by universities and regional technological centers. Paradoxically, the greater the number of dedicated actions, the lower the stability of networks among companies and research centres: the efficacy of specific services need to be improved.

The cluster could become a open space to share and stimulate aggregations and strategic alliances, although networking cost are high and not included in funding actions.

Although some positive experiences have been established both at regional level and EU level, within the advanced materials, advanced manufacturing (automation and mechanics) and nanotechnologies sectors, an integrated approach has not been fully developed. In 2008, additionally to four universities with excellent research standards in mechanical engineering, biomedicine and health, 88 research centers were active in the region, thus creating an inefficient and ineffective overlapping of transfer and co-development actions. Moreover, the districts suffer from a structural lack of skilled human resources able to manage knowledge and technology transfer activities. Policies could act at local level to overcome the existing fragment scenario and provide skills upgrading opportunities. At international level, mobility actions specifically targeting districts human resources might enhance the ability to build and maintain relationships. New aggregations could therefore be enforced outside the regional borders, in coherence with internationalized and interconnected supply chains.

3.2 Internationalisation

Internationalisation is identified as a key strategic element to ensure a global competitiveness, although a lack of strong and coordinated strategies is perceived.

The added value of internationalization lies moreover in the opportunity to include in R&D processes the cooperation with universities and research centres, which are structurally used to global exchange.

The main weakness point is related to the lack of a clear strategy at district level and to the limited dimension of companies. Interviewed stakeholders even doubt there must be a role played by districts, as the services currently offered to companies both at public and private level do not meet expected quality and outcomes, as the necessary skills (i.e., languages, international trade laws, strategic marketing..) are inadequately available among local workforce and actions are limited to EU. Moreover, the costs related to internationalization are often a barrier to SMEs access to global markets. The cooperation and the use of common European tools organised at cluster level has been proposed as a remarkable chance.
Potential opportunities within manufacturing districts concern mainly shared services such as marketing analysis, web marketing campaigns and communication, patenting, law advice. Currently, districts are not involved in internationalization institutional mission.

3.3. Gender, diversity and innovation

Human resources policies facilitating women participation to labour market, although widespread among medium to large companies and universities, are mainly unconscious and top-down, individually-based initiatives (eg. Defined and supported by the owners, top-managers, full Professors).

The main gaps lie in gender-based innovation, both the lack of reliable quantitative data and the qualitative analysis showed how the valorization of gender and cultural- based differences is not yet considered as an asset, rather as an issue to be tackled with a politically-correct approach. Barriers are not even recognized.
Diversity is on the contrary, rather appreciated as a key element in companies which activated strong internationalisation processes. Despite the existing best practices and initiatives, awareness rising actions seem to be the most urgent ones.

There are already a number of private initiatives at regional level which produced good results in gender topic until now, in respondents views. For instance the training of the Women's sector within Confindustria Padova (Province level of the National Association of Entrepreneurs) for women seating in the companies Board, the information and training initiative about the impact of internationalisation for women or Foundation Bellisario local initiatives. At public level, the Green Rose initiative in Veneto financed by the Ministry of Labour and managed by Confindustria Veneto SIAV, involved 7 female companies to create and foster a network for innovation in their respective industries: mechanics, eco-building, textile, footwear and food industries. The initiative proved to be effective in stimulating innovation and also, the other way around, to gain technical insight of new opportunities within specific clusters.

4. Potentials

The qualitative findings confirmed some of the conclusions drafted in the IV Report of the Observatory of Italian Districts (2012), the potentials are identified as:

a. Internationalisation and strategic positioning is among the major competitiveness driver. Distributive policies facilitate innovation and direct investments in order to restrain production costs and to track and control directly foreign or emerging markets;
b. The hybridisation and increased extension of supply chains , crossing or being generated by districts. In fact, the most efficient clusters are part of globally extended supply chains, thus overcoming the proximity and autarchy concepts and working beyond the strategic functions / roles defined internally to the districts;
c. The companies awareness within a wider and broader network of supply chains within the same territory;
d. The participation to smart networks, able to smooth and share knowledge and experiences related on the one hand to product and process innovation and to the other

hand to processes efficiency and new market strategies. The analysis both at national and regional level highlight a new trend: the upgrading of cooperation networks. The boundaries expanded from information exchange platforms to co-design and co-management of raw materials purchase, research systems, products testing, creation and promotion of shared brands. The connection between District and Research, notably Academy, became stronger and further enlarge the smart networks phenomena.

The potential of Emerging Industries and Cross Cutting Issues in the Veneto region could be further exploited thanks to interregional and transnational cooperation, particularly within the emerging industries Green Economy and Active Ageing, by involving sectors and districts such as eco-building, furniture, cooling system, house appliances and home automation and advanced materials.

Moreover, the energy sector could be interested in testing a new model of cluster cooperation.

4.1 Sustainable living and housing

Selection of specialisations at regional level to be brought as a meta-cluster competence:

1. Support to cross-linking among manufacturing and high technology sectors with particular regard to knowledge and technology transfer.
2. Awareness raising and policy in the sustainable/smart mobility.
3. Benchmark of the internationalization policies for industry/research providers cooperation
4. Transition from Regional District law (2003) toward a new law recognizing:
    - companies and industries aggregation
    - Innovation regional clusters

5. Conclusions for pilot development

Veneto has plenty of manufacturers that produce durable goods for the home; part of them are located in industrial districts: two furniture-makers districts (respectively in the province of Verona and in the province of Treviso) and the so-called 'Inox Valley' in the province of Treviso, which specialises in the production of home appliances. A relevant part of these businesses are devoting a great deal of attention and efforts to improving the environmental sustainability of their processes and products. These businesses and districts could be arranged in a regional cluster dedicated to sustainable living, which in turn can participate in initiatives for transnational cooperation dedicated to sustainable development and active ageing. A regional law currently discussed at the Veneto Regional Council encourages the formation of regional innovation clusters such as those described above.

In order to develop a pilot proposal, both the districts and the knowledge providers were involved in meetings and policy dialogues. As a result a pilot shall foster the interaction among furniture, eco-building, home appliances and energy, through interregional alliances.

a) Involving Research and technology transfer centres to cooperate with companies and sectors in the field of *sustainable living*;
b) Include Knowledge and Technology Transfer centres into the definition of a new interregional or international cluster;
c) Identification of the *Leading Enterprises* in order to define and share a common pilot idea.

A conceptual framework toward a sustainable living cluster consider three main elements:

1. Creative Industries, including design, architecture and the Design Faculty of IUAV.
2. The above-mentioned productive chains, who shall benefit from a new type of cooperation (cluster instead of district model), in order to pave the way to an higher added value chain and regular access to knowledge and technological transfer initiatives;
3. Selection of the technological transfer specialisations such as nanotechnologies, advance materials, eco-building technologies.