# SWOT Analysis

## North Aegean Region

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# 1. Introduction

The aim of the SWOT analysis described in this document is to evidence strengths, weaknesses, opportunities and threats for the North Aegean region in order to contribute to the project's effort for developing regional policies that may stimulate the innovative performance of SMEs.

During our work, the distinctive, idiosyncratic characteristics of the region emerged across our findings. The region is an archipelago, unique in geographic and demographic disparity across Europe. Its fragmented configuration has led to a small-scale mentality in almost every aspect of social and business life. At the same time, this resulted in an almost untouched natural and cultural environment. Combined with an exceptional mild climate and a number of unique agricultural products (such as mastic), North Aegean today stands to be benefited by policies that will drive it into the 21st century through smart thinking on how to exploit its unique characteristics while improving its deficiencies.

To that extent, the region is under the spotlight of the Greek government. New legislation to promote growth, combined with EU funding for creating business incubators and the presence of an increasingly important academic institution (University of the Aegean) are some of the new efforts that are currently under way in the region. We hope that the overall findings of the ERMIS project will help us to further expand our thinking and know-how, as well as help influence the development of new regional innovation policies for making the North Aegean an innovation hub in the Mediterranean.

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## 2. Objectives and priorities of the region

Traditionally, the administrative bodies of our region allocate a low share of their funds in research and development. Furthermore, these funds were actually used for infrastructure projects because:

- the region is in serious need of such projects
- regional lobbies favored such projects.

The country's Strategic Plan for the Development of Research, Technology and Innovation 2007-20013 continues the tradition of focusing on infrastructure development. The key priority for the region is the improvement of transportation links:

- between the region's islands and mainland Greece
- among the islands themselves
- within the islands' remote areas and the islands' administrative, business and transportation centers (ports, airports).

At the same time, emphasis will be given on the protection on the environment, which is the key economic resource for the region. Investments in waste management, water supply management and sewage infrastructure will receive priority funding.

In terms of business/economic development, the objective is to focus on the 'green' economy, with particular emphasis on tourism and agriculture (organic products, commercialization of unique local products, etc.). Investments in technology will be mostly allocated to infrastructure projects, such as the development of broadband networks and Wi-Fi infrastructure for businesses.

The implementation of these region-specific plans will be guided by the recently updated EU Regional Innovation Scoreboard, in order to better allocate funds and ensure that measurable returns are actually achieved. They key metrics that will be in focus are:

- Enablers
  - Tertiary education
  - Life-long learning
  - Public R&D expenditures
  - Broadband access by businesses
- Business activities
  - Business R&D expenditures
  - SMEs innovating in-house
  - Innovative SMEs collaborating with others
  - Patents filed with the European Patent Office (EPO)

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- Outputs
    - Product and/or process innovators
    - Marketing and/or organizational innovators
    - Resource efficiency innovators (labor, energy)
    - Employment in medium-high & high tech manufacturing
    - Employment in knowledge-intensive services
    - New-to-market sales
    - New-to-business sales.

Currently, the region is using a subset of these metrics in order to assess innovation and innovation policies. The following table shows the values of these metrics for years 2000-2005.

| Regional innovation performance metrics (ranking of our region: 202 out of 208 regions) – Year 2006 | T – 4 | T – 3 | T – 2 | T – 1 | T |
|---|---|---|---|---|---|
| Human resources in Science & Technology (% of population) | N/A | 64 | 61 | 58 | 61 |
| Public R&D expenditures (% of GDP) | 32 | 32 | 32 | 32 | 32 |
| Business R&D expenditures (% of GDP) | 1 | 1 | 1 | 1 | 1 |
| Employment in medium-high and high-tech manufacturing (% of total workforce) | 10 | 10 | 10 | 10 | 10 |
| Number of patents applied for at the European Patent Office (per million population) | 0 | 0 | 0 | 0 | 0 |

Source: 2006 European Regional Innovation Scoreboard
Figures are relative to EU data and for a period of 5 years

# 3. Profile of the region

The region of the North Aegean is comprised of the north-eastern territories of Greece. Administratively, it is one of the 13 regions of the country ("perifereies") and consists of 3 prefectures: Lesvos prefecture, Chios prefecture and Samos prefecture. The following map indicates the location of the region by highlighting its islands in red.

The region includes 9 islands, with different size and population profiles. The following table provides relevant information on the frontiers of the region, based on data from the Hellenic Statistical Authority.

| | North Aegean region | Lesvos prefecture | Chios prefecture | Samos prefecture |
|---|---|---|---|---|
| Area (km$^2$) | 3,836 | 2,154 | 904 | 778 |
| Population | 200,517 | 105,957 | 51,957 | 42,603 |
| Population density (per km$^2$) | 52.27 | 49.19 | 57.47 | 54.75 |

*Source: Hellenic Statistical Authority*
*Population data: permanent residents, 2008*
*Lesvos Prefecture: islands of Lesvos, Limnos and Agios Efstratios*
*Chios Prefecture: islands of Chios, Oinousses and Psara*
*Samos Prefecture: islands of Samos, Ikaria and Fournoi*

### a. Industrial profile

The industrial profile of the region was developed along two dimensions: diversification and maturity.

In order to define the level of **diversification or specialization** of the region, we used labor market data referring to the second quarter of 2010. There are 19 industry sectors where the regional population is employed. The top 3 industries in the region (in terms of share of employment) are:

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- Wholesale & Retail Trade
    - Share of employment S1: 15.4%
- Agriculture, Forestry & Fishing
    - Share of employment S2: 12.5%
- Hotels & Restaurants
    - Share of employment S3: 10.0%

The remaining industry sectors have single-digit share of employment, ranging from 0.3% (mining) to 8.9% (construction). Based on the above data, the Herfindhal Index (HHI) is:

$$HHI = (S1^2 + S2^2 + S3^2) / 10{,}000 = 0.049 < 0.1$$

Hence, our region is categorized as **'low specialization' region**.

In order to define the level of **maturity** of the region, we first explored the potential industry types of the region's top 3 industry sectors. Based on quantitative data and interviews, we concluded that: a) the entry of new firms to these industries is low; b) there is high concentration of businesses in these sectors; and c) innovation is essentially process innovation.

Hence, the selected industries are of **Type 1**, i.e. mature industries with high barriers to entry. This, in turn, implies that small firms in the region may only have business opportunities as suppliers of incumbent firms.

We then complemented the above analysis by exploring the potential innovation profiles of the region's top 3 industry sectors. Based on quantitative data and interviews, we concluded that: a) there is low share of innovation by SMEs (e.g. non-existent patents); b) these sectors are low-tech sectors. Hence, the selected industries are of **Type C**.

Overall, the maturity type of the region's top industry sectors is **Type 1C**, i.e. innovation is not a source of competitive advantage for these industries.

# 4. Reference regions

The selection of the reference region was not a straightforward task. We followed the proposed two-step process: first, select regions with similar size and population density that display better economic and innovative performance than our region. Then, filter in those regions that host the same type of dominant industries and potentially exhibit similar innovation profile.

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For the first step, we tried to short-list regions by looking at:

- geographical similarities to our region (e.g. regions that include islands, or regions that are only comprised of islands)
- area size
- population size
- population density (per sq. km).

The unique profile of our region inhibited a close match that could satisfy all or most of the above criteria. The following table indicates our short-list of candidate reference regions.

| Country | Region | Area (km²) | Population | Population density (per km²) |
|---------|--------|-----------|------------|------------------------------|
| Greece | North Aegean | 3,836 | 200,517 | 52.27 |
| Belgium | Luxembourg | 4,443 | 261,178 | 59.00 |
| UK | Cornwall and Isles of Scilly | 3,563 | 534,300 | 150.00 |

Source:
http://en.wikipedia.org/wiki/Nomenclature_of_Territorial_Units_for_Statistics
http://epp.eurostat.ec.europa.eu/portal/page/portal/region_cities/regional_statistics/data/main_tables

The profile of Cornwall and the Isles of Scilly is somewhat closer to that of our region. Cornwall is one of the poorest regions in the UK, with its GDP standing at 79.2% of the EU-27 average (2004). It is one of four UK areas that qualify for poverty-related grants from the EU and it was granted Objective 1 status by the European Commission, followed by a further round of Convergence Funding.

Cornwall's economy is increasingly depending on tourism. Its unique culture, spectacular landscapes and mild climate make it a popular destination, despite being distant from the UK's main centers of population. Fishing and agriculture play an important role, although they are on decline. In recent years, Cornwall's creative industries have undergone significant growth, thanks in part to the aforementioned EU funding. Today, a vibrant creative industry in Cornwall is encompassing businesses in graphic design, product design, web design, packaging design, environmental design, architecture, photography, and arts & crafts.

In terms of its innovation profile, and based on the 2009 European Commission's assessment of Europe's Regional Research Systems, Cornwall is "comparatively public-sector-oriented". Furthermore, "it is not home of outstanding centers of excellence in either public sector or business research".

### a. Comparing economic performance with the reference region

A number of indicators were used in order to baseline the performance of our region against that of the reference region. The following table depicts the main indicators we used.

| Indicators | North Aegean Region | Cornwall and Isles of Scilly Region |
|---|---|---|
| Evolution of population (10 years) | -2.1 % | 8.9 % |
| Migration rate | N/A | N/A |
| GDP per capita (2007; in Euros) | 14,545 | 21,595 |
| Employment rate (2009) | 58.6 % | 69.5 % |
| GDP per worker (2009; in Euros) | 37,857 | 43,468 |
| Growth of GDP (2006 – 2007) | -1.6 % | 5.8 % |

## 5. Regional performance – quantitative analysis

Based on the above comparative results, a SWOT analysis on the economic competitiveness of the region was undertaken. The general rule that we followed for all the SWOT analyses described in this document is the following:

- Strengths (S) and Weaknesses (W) evaluate resources of the region
- Opportunities (O) and Threats (T) are related to external events/factors that may (positively or negatively) affect the future economic performance of the region.

| | Economic competitiveness of the region |
|---|---|
| Strengths | • Good quality and variety of local agricultural products. Several of them are labeled as PDO (Protected Designation of Origin)<br>• Rich culture<br>• Pristine environment |
| Weaknesses | • Low productivity across many of the industries in the region<br>• Basic infrastructure facilities require further improvements (ports, roads, etc.)<br>• New energy sources (or expansion of existing ones) are needed<br>• Ageing population |

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| Opportunities | <ul><li>Protection and strategically planned exploitation of natural and cultural resources</li><li>Improvements in transportation links with the rest of Greece/Europe in order to contain the "psychology of isolation" that may deprive businesses active in the region from reaching their true potential</li><li>Turning its "frontier region" position into a position of "port of entry" to Europe</li></ul> |
|---|---|
| Threats | <ul><li>The country is hard-hit by the economic crisis. Current efforts are focused more on containing public deficit rather than achieving growth (although this is changing)</li></ul> |

| | *Entrepreneurship performance* |
|---|---|
| Strengths | <ul><li>SMEs that commercially exploit local agricultural products. For example, mastic production in Chios is a global monopoly</li></ul> |
| Weaknesses | <ul><li>Low degree of cooperation among the industry sectors active in the industry</li><li>Small firms, mostly focusing on the region's markets (which are small too)</li><li>Average educational level of the region's workforce</li><li>Highly educated personnel is usually transient in the region and/or is not offered enough opportunities that will enable such workers to reside permanently in the region</li><li>Gender inequalities in terms of access to the labor markets of the region</li></ul> |
| Opportunities | <ul><li>Expand the region's tourism industry</li><li>Increase cooperation among the region's firms in order to lower their respective costs of operation, as well as develop joint products and services</li><li>Be more outward-facing when thinking about new markets for the region's products and services</li><li>EU funding opportunities</li><li>Better links with the University of the Aegean, the region's fairly recently established academic and research institution</li></ul> |
| Threats | <ul><li>Local businesspeople and entrepreneurs find it difficult to differentiate their products and services from those offered by the competition (within and outside Greece)</li><li>Local workforce finds it difficult to adapt to technological innovations in their respective fields</li></ul> |

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| | Innovative outcomes |
|---|---|
| **Strengths** | • The University of the Aegean plays an increasingly important role in the promotion of innovation of the region (however, it lacks significant links to the businesses of the region) |
| **Weaknesses** | • Low adoption of new information technologies<br>• No recent patents or patent applications<br>• No high tech companies (as defined by NACE 24.4, 30, 32, 33, 35.3)<br>• Almost no medium tech companies (as defined by NACE 24, 29, 31, 34, 35.2, 35.4, 35.5) |
| **Opportunities** | • Strengthening the links between the University of the Aegean and the business firms of the region, especially in terms of supporting life-long education of local workforce<br>• Greek government (and EU) funding for linking SMEs to the University and other R&D institutions<br>• New funding from the Greek government to boost innovation through development of a regional business incubator |
| **Threats** | • Local workforce finds it difficult to adapt to technological innovations in their respective fields |

| | Access to finance |
|---|---|
| **Strengths** | • Public R&D investment but limited to infrastructure projects<br>• Presence of all Greek banks, with full array of financial products |
| **Weaknesses** | • No venture capital firms<br>• No business angels<br>• Very low private R&D investments<br>• Very low venture capital investments |
| **Opportunities** | • Access to EU funds<br>• Access to Greek government funds<br>• Large community of emigrated Aegean inhabitants who may be willing to invest in their motherland<br>• Large number of Greek ship-owners who were born and raised in the Aegean islands and may be willing to invest in improving the economic profile of the region |
| **Threats** | • Economic crisis, that makes the fight for financing even more difficult<br>• There is an on-going restructuring of the regional public sector in Greece that may delay processing and awarding of public funds |

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| | **Human capital** |
|---|---|
| **Strengths** | • University of the Aegean  - about 600 researchers in various fields (from business administration to industrial design)<br>• In 2009, 5,000 workers were involved in science & technology (education, occupation) in the region |
| **Weaknesses** | • Majority  of those involved in science & technology are involved in the education part<br>• The majority of students come from outside the region and they return to their home regions after graduation<br>• Very limited number of foreign post-graduate students<br>• No executive education<br>• Limited life-long education |
| **Opportunities** | • New funding from the Greek government specifically targeting life-long education in the region |
| **Threats** | • The economic crisis may lead to decreasing number of people (and especially skilled workers) that stay or want to move into this rather isolated region. |

| | **Technology transfer** |
|---|---|
| **Strengths** | • Aegean Technopolis is the technology park of the region (however, its scale is still very limited) |
| **Weaknesses** | • No business incubators, either private or public |
| **Opportunities** | • New funding from the Greek government to boost innovation through development of a regional business incubator |
| **Threats** | • There is an on-going restructuring of the regional public sector in Greece that may delay the development and implementation of relevant policies and initiatives |

| | **Quality of infrastructure** |
|---|---|
| **Strengths** | • Broadband connections, both for households and SMEs, is on the up, due to subsidized connectivity plans<br>• Airports in several of the islands in the region (Chios, Mytilini, Samos, Ikaria, Limnos) |

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| | |
|---|---|
| | • Ports in all islands<br>• Cost of living |
| **Weaknesses** | • Basic infrastructure facilities require further improvements (ports, roads, etc.)<br>• New energy sources (or expansion of existing ones) are needed |
| **Opportunities** | • Improvements in transportation links with the rest of Greece/Europe in order to contain the "psychology of isolation" that may deprive businesses active in the region from reaching their true potential |
| **Threats** | • The country is hard-hit by the economic crisis. Current efforts are focused more on containing public deficit, with corresponding cuts on infrastructure development initiatives |

| | *Legal and regulatory environment* |
|---|---|
| **Strengths** | • Lower tax regime than mainland Greece |
| **Weaknesses** | • As for the rest of the country, significant bureaucracy in starting or closing a business<br>• No patent application office |
| **Opportunities** | • New legal framework proposed by the Greek government in order to enable fast-start of new business ventures<br>• New legislation for SME development in Greece, with significant tax subsidies<br>• New structure of regional public administration that is operating since 1/1/2011, leaving space for new ideas and propositions |
| **Threats** | • The region stays entangled in existing bureaucracy |

# 6. Regional performance – qualitative analysis

Our qualitative analysis was based on network analysis, as proposed by the MERIPA study (Methodology for European Regional Innovation Policy Assessment), in order to estimate the level of interdependence between key players. Its goal was to gather enough information for generating a good picture of stakeholders' opinions on what particular innovation support our region will require.

To that extent, we gathered questionnaires from regional public administrators, academic personnel, consultants, and business managers and owners. The following tables depict our findings.

| | *Governance* |
|---|---|
| **Strengths** | • Funding education and workforce training through the national social security system |
| **Weaknesses** | • Small number of firms that take advantage (or are even aware) of state-subsidized workforce training |
| **Opportunities** | • New legislation for providing public loans/investments and public support for private loans and investments for business start-ups initiated by young entrepreneurs and scientists<br>• New legislation for tax credits on SMEs that reinvest sales proceeds in the growth of the firm |
| **Threats** | • No clear strategy on offering access to seed and venture capital, beyond bank loans<br>• No clear policies on attracting external know-how, e.g. consultants |

The following table is a common analysis for the top 3 industries of the region.

| | *Industry situation* |
|---|---|
| **Strengths** | • Access to finance: all Greek banks have branches (but not in every island)<br>• Human capital: University of the Aegean professors and researchers<br>• Quality of infrastructure: basic infrastructure exists (airports, ports, roads, etc.) but improvements and expansion are required<br>• Regulatory framework: favorable taxation, compared to mainland Greece |
| **Weaknesses** | • Access to finance: no venture capital firms or business angels<br>• Human capital:  Low use of external know-how (e.g. consultants).<br>                      Skilled workforce (especially in technology-related disciplines)<br>• Quality of infrastructure: still lacks compared to mainland Greece and the reference region |

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| | |
|---|---|
| | • Technology transfer: almost non-existent |
| **Opportunities** | • Access to finance: new legislation that promotes entrepreneurship in Greece, combined with tax credits<br>• Human capital: incentives for skilled workers and businesses to move and permanently reside in the region<br>• Quality of infrastructure: new funding from the Greek government for establishing broadband infrastructure on all the islands of the region<br>• Technology transfer: new legislation for developing a regional business incubator<br>• Regulatory framework: new regional public administration structure may reduce bureaucracy and promote fast-track legislation |
| **Threats** | • Access to finance: economic crisis may make hunting for funding even more difficult<br>• Human capital: lack of technology-skilled workers<br>• Technology transfer: focus on improving existing basic infrastructures rather than promoting growth through innovative businesses<br>• Regulatory framework: new regional public administration structure may delay policy development and implementation |

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