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Territorial Diagnosis – Southwest Finland Region

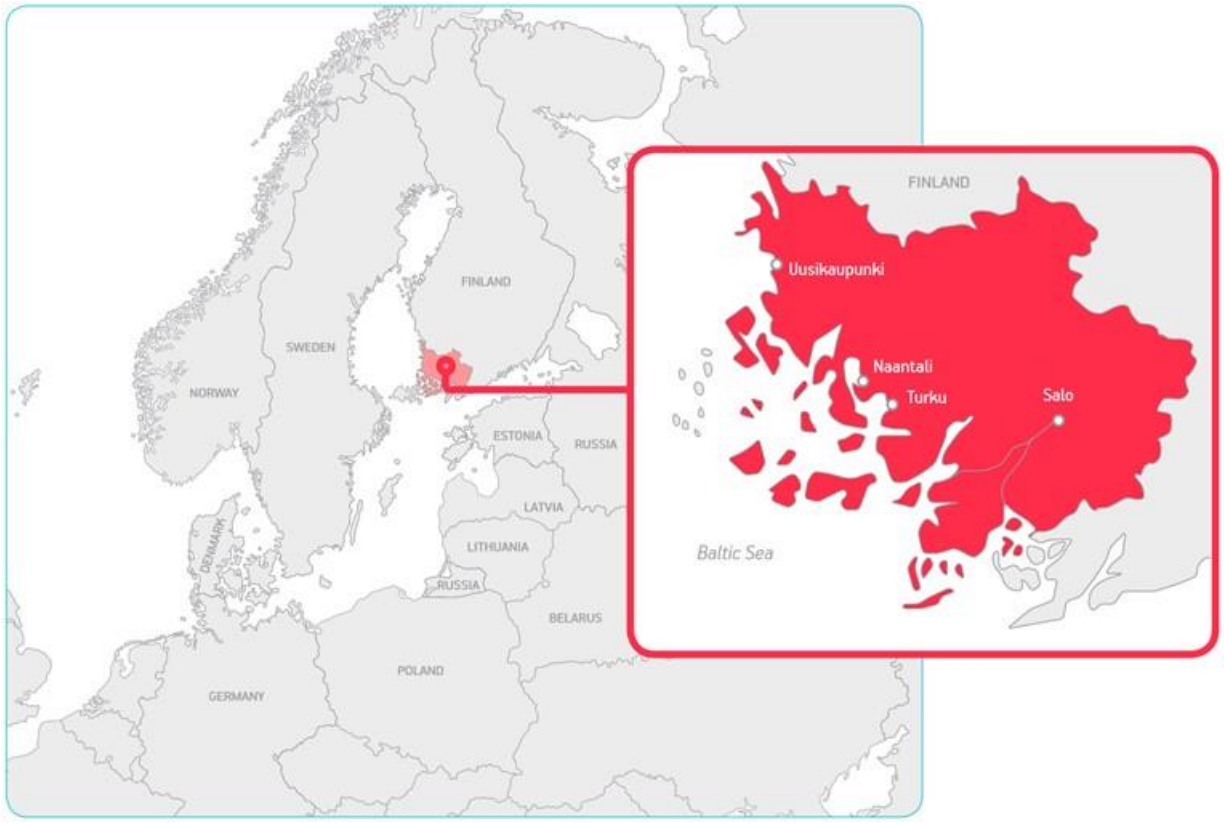
1. The Background: Southwest Finland Region

The region in brief. Southwest Finland and its capital city of Turku are situated on the coast of the Baltic Sea, in the southwestern corner of Finland. A maritime atmosphere and old agricultural sector meet modern city culture, and rich history meets high technology in this versatile region. With a population of 458,000 inhabitants, Southwest Finland is the third biggest region in Finland. The population density is 42,9 inhabitants/km^2 (2013). Some 5,8% of the inhabitants speak Swedish as their mother tongue in this bilingual region. (Picture 1)

With a population of 176,000, Turku is the fifth largest city in Finland. Other major cities are Salo, Parainen, Loimaa and Uusikaupunki. Industrial hotspots are Meyer Turku (shipyard), Beyer Orion (Big Pharma), Valmet Automotive (Car manufacturing).

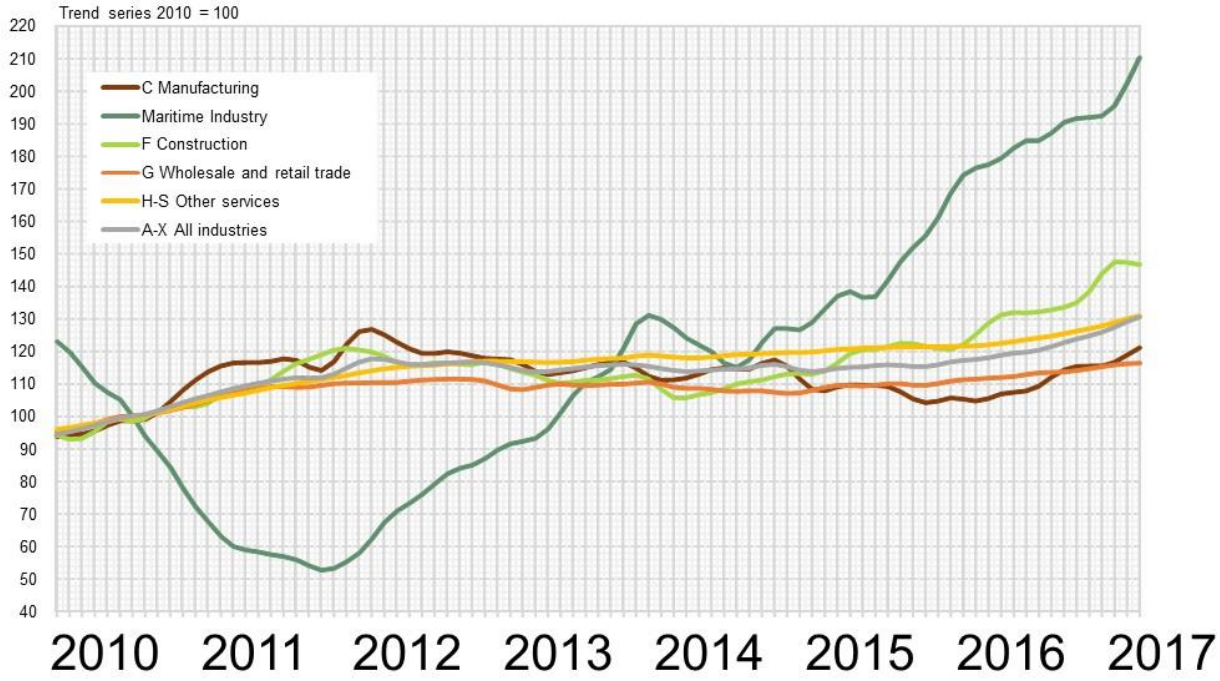
The Major ports are the Port of Turku, the Port of Naantali and the Port of Uusikaupunki. Southwest Finland is Finland's leading agricultural area and a significant food producer. There is a unique competence network in shipyards, and the cooperation between Turku's shipyards and its subcontractors has resulted in the biggest and the most environmentally friendly cruisers in the world. Marine and metal industries form the base in the region's economy. The bio cluster has long been emphasized in the region's development. Traditional industry has made way for the services sector.

The region's environment offers unique possibilities for developing tourism. Southwest Finland has a unique archipelago and a growing cultural scene – and the number of tourists visiting the region is growing steadily. (Council of Southwest Finland 2016)



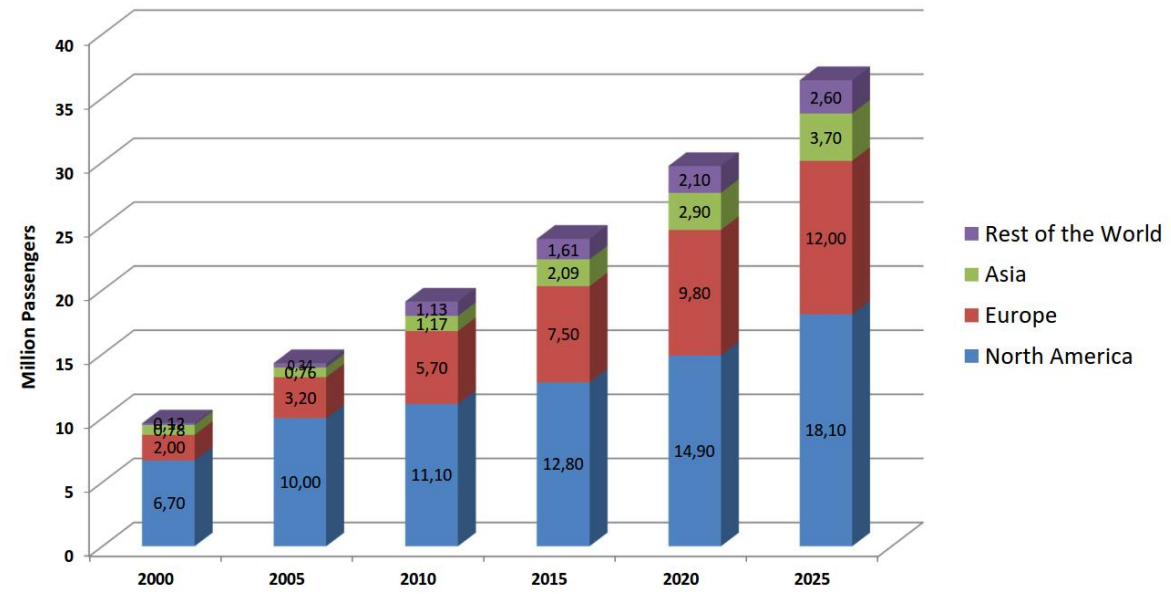
Picture 1: Southwest Finland Region (Regional Council of Southwest Finland)

The maritime industry is heavily concentrated in Southwest and South of Finland. The main maritime production area is Turku region. The crisis 2008 was difficult also for the Finnish Technology Industry and maritime industry. The turnover of maritime industry companies in Turku Region has been growing since 2010 steadily and this development is expected to go on in the near future. One of the main business areas, cruise vessel will as the amount the cruise passengers are expected to grow (pictures 2 and 3).



Picture 2: Development of turnover by business sectors in the Turku Region 2010–2017 (January – March) (Turku Science Park Ltd, Statistics Finland, 2017)

During the economic crisis in 2008 the production of regional and national maritime industry decreased but there were also big vessels under construction in STX Turku Shipyards (now Meyer Turku) until 2010. Some smaller companies had order books until 2009-2010. Several companies had orders from offshore oil & gas industry mainly from Norway and Russia and large number of companies changed their strategies to global maritime industry. Some of the made a value-chain shift from subcontractor to design / engineering company. This explains the rise from the bottom in 2011. The maritime industry strong growth began when Meyer Werft acquired STX Turku Shipyard and this growth is still going on. After the financial crisis the Finnish Ministry of the Economy and Employment launched several new activities for renewal and improving the competitiveness of maritime industry in Finland (eg. Arctic Seas Programme).



Picture 3: Cruise Passenger Growth 2000 – 2025 (Meyer Turku Ltd)

When looking at only the Meyer Turku shipyard and its' network's value of the deliveries we see that over 75 % comes from Finland and Southwest Finland's share of that is over 50 %. Again Meyer Turku shipyards employees 85 % comes from Turku Region, so the economic impact for the South West Finland is remarkable and the near future development makes it even more significant.

We need to bear in mind that still a vast number of Finnish maritime industry companies work totally in global markets with no connection to cruiser vessel production and in other segments of maritime industry as merchant vessels, ice-breakers, offshore energy producing eg. engines & power supply, propulsion systems, refurbishment and ship design & related software.

1. The Finnish Maritime Technology Industry

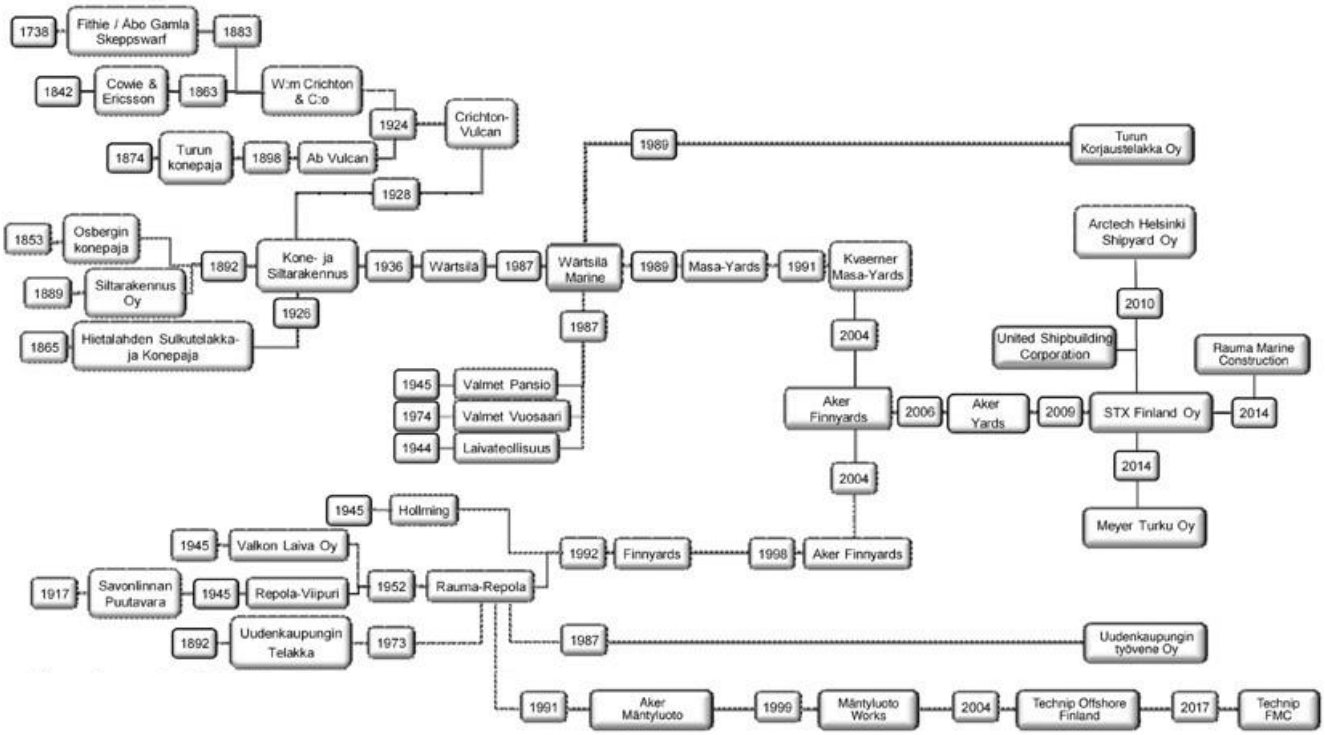
Shipbuilding accelerated sharply since 1950s when and new shipyards were established along the coast. In the 1950s and 1960s, Wärtsilä, Rauma-Repola and state-owned Valmet were the largest shipyard companies from the 1950s to the 1980s. Valmet and Wärtsilä's shipbuilding activities were merged into Wärtsilä's 1986 marine industry, which ended up in 1989.

The Finnish shipbuilding competence is on a high level due to extensive experience, through a rapid industrialisation process during last 70 years. Through consolidation and

increased specialisation during and after this time period, the previously small Finnish shipbuilders became relevant actors on the international market.

At that time the products were mainly cargo ships, tankers and barges, but the by the 1980s production already included ro-ro ships and special vessels such as exploration and mooring ships. Icebreakers have been the competence area of the Helsinki shipyard.

Since the 1970s the production diversified into car ferries and cruise ships. The 1990s and 2000s were the gold time of building cruise ships at the shipyards of Helsinki and Turku. After several mergers and MBOs spin off from the shipyards picture of Finnish Maritime industry is what it is at the moment (Picture 4).



Picture 4. The Evolution of Finnish Maritime Industry (AFMI 2017)

Today, marine industry is one of the key industries of Finland. It consists of shipyards, repair and offshore yards, equipment manufacturers, turn-key companies, design and engineering offices and software providers. There are 1000 marine industry companies which employ over 30 000 persons. Marine industry turnover is € 8 billion and growing in future years, and over 90 % of the production is exported.

Finnish shipyards, repair and offshore yards employ 15-20 % of the maritime industry work force. Big and global technology manufacturers (propulsion systems, cargo handling, et cetera.), as well as design and engineering offices, etc. employ the rest 80-85 % of the industry's employees.

Finnish shipyards have provided vessels for ship-owners around the world, for example the world class cruise vessels operating in the world seas. Besides cruise ships, Finnish shipbuilding is specialised in passenger ferries, icebreakers and military ships.

Finland is more dependent on seaborne goods traffic than most of its neighbouring countries. About 90 % of its exports and 80 % of its imports are carried by sea. Shipping industry is still strong; only around 40 % of the sea transport was carried out by Finnish vessels.

Most of the maritime industry companies in Southwest Finland region are located in Turku. Some part are located in neighboring towns Raisio and Kaarina. There's also a small cluster of companies in Uusikaupunki and Salo areas, where some of the small shipyards are located (Uki Workboat, Western Shipyard, Marine Alutech). In 2017 there were only few shipyards in Finland anymore: Meyer Turku, Arctech Helsinki, Turku Repair Yard, Uki Workboat, Western Shipyard, Marine Alutech and Rauma Marine Constructions. Five out of these seven are in Southwest Finland region.

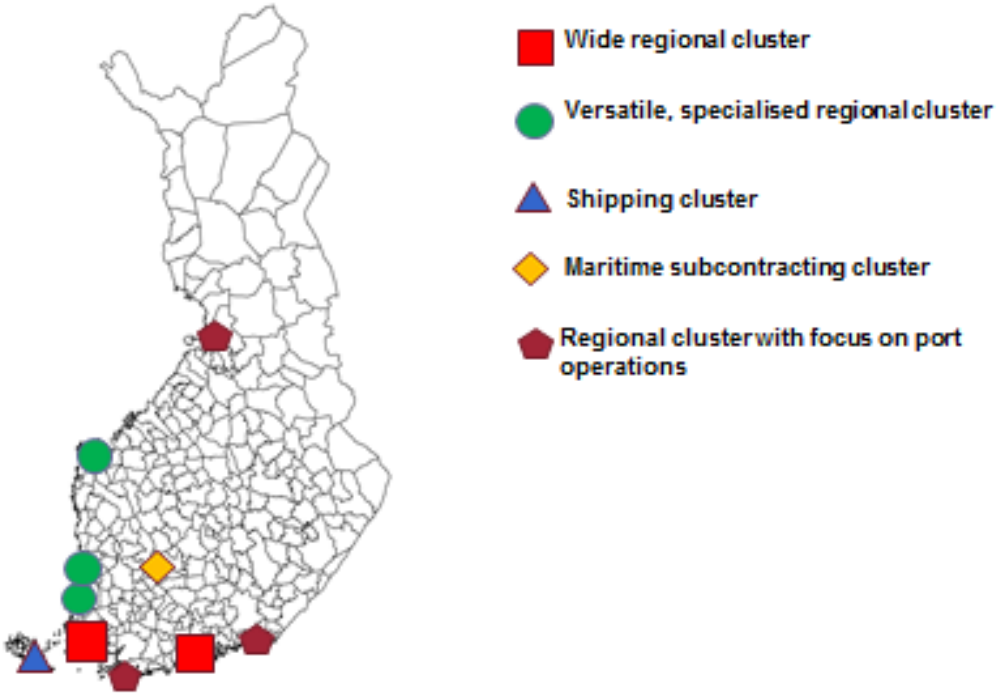
Meyer Turku Oy specialises in building cruise ships, car-passenger ferries and special vessels. The company has also subsidiaries, which provide necessary final solutions and services. Piikkio Works Oy is a cabin factory in Piikkiö, Shipbuilding Completion Oy provides turnkey solutions to public spaces in ships and ENG'nD Oy is an engineering company offering services for shipbuilding and offshore activities.

Turku shipyard has been a technically advanced company. They constructed a passenger ferry for Viking Line, which uses LNG as fuel (picture 5). They also started construction of a similar ship for Estonian Tallink company in 2015. They constructed, among other things, a small offshore installation vessel for Meriaura, with special features, such as dynamic positioning, and it is the first double acting dry cargo ship (DASTM) in the Baltic Sea. The vessel can also be used for preventing oil pollution, with large tanks that, when in use will double the Finnish oil pollution prevention capacity (Meriaura 2016). Moreover, the vessel uses bio-oil as fuel.

Picture 5: The M/S Viking Grace, completed in 2013 was the first LNG passenger vessel, is a great example of Blue Cleantech™ expertise

Arctech Helsinki Shipyard Oy specialises in Arctic shipbuilding technology, e.g. building icebreakers and other Arctic offshore and special vessels. As the Helsinki shipyard has constructed 60% of all icebreakers operational today worldwide, and Russia needs to renew its icebreaker fleet, while simultaneously investing in its shipyards and shipbuilding competence, the co-operation gives the Russian corporation a good opportunity for learning; i.e. so called technology transfer.

In addition the Turku Repair Yard, which is owned by Estonian BLRT carries out different types of repair work, refurbishing, conversions.



Picture 6: Regional Maritime Cluster in Finland (University of Turku 2016)

2. SMEs competitiveness by improving industrial performance

Over the last decade, the Finnish marine industry has made new innovations, especially targeted in making ships greener: increasing the energy-efficiency of vessels e.g. by hull design; and developing some alternative fuel solutions, not only LNG-powered but also bio-fuel-powered.

The Finnish equipment manufacturers, also called material and system suppliers, manufacture many products, such as environmentally friendly LNG-fuelled engines aimed at conserving the environment, and the most advanced propulsion systems for energy efficiency. Other Finnish innovations include the Hi-Fog fire protection system, which extinguishes fires with water mist.

Material and system suppliers are of great importance, as their share of the marine industry is bigger than that of the shipyards. Many of them are global operators. The trend has for many years been towards increasing outsourcing; of design to design companies as well as manufacturing of larger areas (cabins, public spaces, HVAC, restaurants, etc) to the so-called turnkey suppliers.

However, the changes in ownership and management and the uncertainty of the business have resulted in a lack of long-term development strategies and has influenced investments negatively. Strong ownership have in many case strengthend and ensured a long-term commitment to invest in production improvements, as well as in securing a functioning partner network.

The main challenge lies in staying competitive in order to secure future orders. This means keeping control on costs but also investing in further developing facilities, competences and ways of working to ensure maximal efficiency and a high degree of innovation. Modularisation is one area that has been developed in order to enable mass customisation and further decrease lead times; material technology is another very important area to e.g. reduce ship weight, improve safety etc.

When energy prices have increased rapidly, one focus area is energy efficiency and fuel technology is a major opportunity as the environmental regulations by IMO are becoming stricter and place a demand for new fuel types and machine technology solutions (IMO 2008). The sulphur oxide (SOx) and nitrogen oxide (NOx) regulations are getting more exacting, which means for example that in the long term new fuel types need to be found to replace heavy fuel oil, especially in the ECA areas (Emission Control Areas).

The whole Maritime Cluster in Finland impacts on various economic sectors, involves hundreds of companies and public sector organisations with tens of thousands employees. The cores of the cluster include seafaring, marine industry and port operations. Many Finnish maritime cluster companies provide products and services to several maritime segments both internationally and in Finland.

The Finnish shipbuilding industry is operating in a niche market with high-value added products and services, in particular with its focus on cruise and passenger ships as well as ice going vessels. This is a big challenge. As well as the cyclical nature of the maritime business brings challenges for the Finnish maritime industry, the lack of skilled labour force may affect the development of the industry also. Therefore, the Finnish maritime industry aims to invest in cost efficiency using notably more digitalization, automatization and robotisation as well as innovations and strengthening of international networks to counteract a potential downturn in the industry.

Economic Performance**.** According to the study of University of Turku the general outlook for companies in the maritime cluster is good, but competition is intense. Global market cycles influence different parts of the cluster in different ways and with different timings. Only a third of the turnover is generated by companies with domestic majority ownership. A major share of large companies are foreign-owned. According to the study, the added value created by the whole maritime cluster is very high: EUR 3.8 billion. The margins made by the Finnish shipyards are quite small, and therefore there has been periods when shipbuilding has not been very profitable business and the Finnish shipyards have been suffering from poor profitability and changes in ownership. The financial crisis in 2008 hit hard the maritime industry and its' competitiveness and the profitability. Since then the economic outlook has been better and the future can be promising.

3. SMEs competitiveness by strengthening value chains

The main maritime cluster is Association of Finnish Marine Industries (AFMI). Finnish Marine Industries is a co-operation forum for high-technology maritime solution providers, leading marine equipment manufacturers, turn-key suppliers, designers, software and system providers as well as shipbuilding, ship repair and offshore yards. The association promotes favourable conditions in industrial and economic policy for the Finnish marine industry. The association offers its members, public authorities and the media with the latest relevant information on the marine industry sector in Finland. Currently, the association has over 80 member companies.

The association promotes networking, coordinates RDI activities represents Finnish maritime industry in EU level, eg. SeaEurope.

Future Development areas in South West Finland

City of Turku. Turku region has been active in developing the maritime industry during last decade. Turku commits a special emphasis in increasing the innovation activities research

and development among the industry and scientific actors. The City of Turku established the Turku Future Technologies Concept TFT (see below). TFT is co-operational network of eight Finnish universities who offer broad-based research excellence to improve competitiveness and growth in technology companies in South-West Finland and support a strategic development project of a company by speeding up know-how development.

There has been several Project and Programmes that Turku has initiated and also funded. Some previous examples are: Maritime Cluster Programme (2007-2013), Structural change project for Maritime Industry (2010 – 2012), Meridiem – Maritime Research Hub (2011-2014), TurkuSeas2020 (2014-2016), grants for technical professorships and lecturers.

Active maritime projects are:

Blue Industry Park is an industrial development area adjunct to the Turku shipyard. The aim is to improve productivity of the maritime industries by developing production process and technologies and network-based working method. The upcoming LNG terminal will provide new smart energy network in the area (picture 6).

- Blue Industry Park (BIP) is a cluster of maritime industrial operators, service business and R&D, which is to be built to the immediate vicinity of the dockyard in Turku.
- BIP offers concentration benefits, synergetic business benefits and competition benefits, and it improves the ability of marine and manufacturing industry to continuously develop their operations.

Blue industrial Park advantages:

- Hundreds of companies representing 40 % of the Finnish maritime industry's hub
- Excellent logistics by road and rail network, large loading area possibility
- Skilled workforce and R&D services from Universities and private companies
- Blue Cleantech and development expertise. Arctic Business Centre planned.

Blue Industry Park will be more than just technology park, but more advanced area or place where different business partners can collaborate and find synergies. Some may have nothing to with the shipyard, some will have strong connections. It's the mixture of shipbuilding / ship repair (Maritime technology Industries), transport (logistics, port operations etc.) offshore oil & gas But strong emphasis on Maritime Technology and Shipbuilding. The

The concept plan for the Blue Industry Park (BIP), located near the Meyer Turku shipyard, has been completed in December 2017. The aim is for the Blue Industry Park to become the production and innovation cluster for the maritime and manufacturing industry. Its role will be to meet the growth needs of the maritime and manufacturing industry in the Turku region and the rest of Southwest Finland and promote the industry's future competitiveness.

The area Blue Industry Park is approximately 55 hectares of land and the construction of the new facilities will be implemented in stages between 2019 and 2030. The next step will be to prepare a detailed business plan, which will completed in spring 2018.

The Turku region is one of the locomotives for Finland's strong economic growth. In order for this growth to continue in the next decade, it will require persistent, internationally interesting and ambitious investments into the future. The Blue Industry Park will be one of the most important projects for industrial policy in the coming years.

Picture 7: Illustration of potential Blue Industry Park area (Turku Science Park. 2017)

Turku Future Technologies (TFT). There are some 15 universities in Finland both educating maritime professionals in different fields of expertices as well as actively performing maritime research. In 2016 Turku Future Technologies (TFT), a new concept of eight universities was founded. These eight universities have strong aim to increase scientific cooperation nationally and internationally. The innovation society also cooperates with national and international networks such as ministries, innovation centers and regions. With its activities they aim to improve the competitiveness of the business and region by increasing the longterm research cooperation between the scientific community and companies.

Autonomous Shipping Project. Rolls-Royce has announced to make remote and autonomous shipping a reality and reap the benefits of increasing digitalisation in the marine industry. RR and its' partners had significant research grant by Tekes - the Finnish Funding Agency for Innovation. The funding will enable Rolls-Royce to invest further in a research and development centre in Turku, Finland and also a real testing and piloting area.

Rolls-Royce is pioneering the development of remote controlled and autonomous ships, applying technology, skills and experience from across its businesses with the ambition of seeing a remote controlled ship in commercial use by the end of the decade.

The Marine division of Rolls-Royce already has strategic partnerships with Research Centres and Universities in Finland, Norway and Singapore, together with numerous collaboration projects with SMEs and start-ups specialising in novel technologies. The aim is to develop partnerships and opportunities with different organisations around the world to create the capability and competencies to supply the technology and services required.

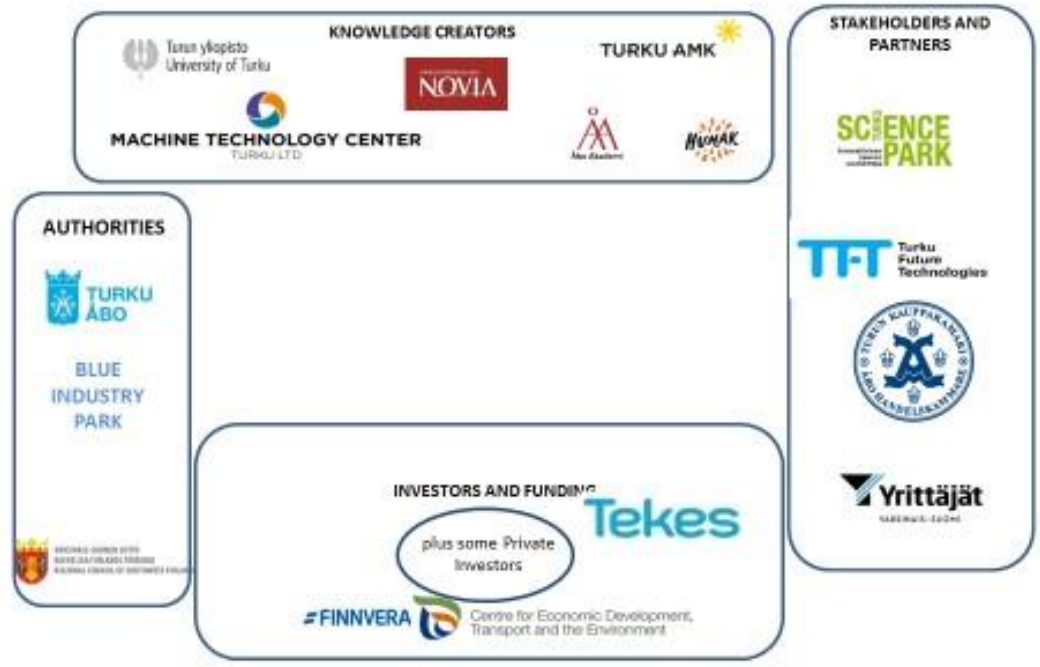
Other relevant public authorities in SouthWest Finland Region (picture 8):

Turku Chamber of Commerce. The purpose of the Turku Chamber of commerce can be divided into three parts: networking, co-operation and promoting interests of the companies in the region.

Turku Science Park Ltd. Turku Science Park offers, along with the entire region's business service network, diverse business operation development services which cover all stages of a company's life cycle.

Machine Technology Center Turku Ltd. Machine Technology Center Turku Ltd. is a modern learning, training and development center for technology enterprises, educational institutes and researchers in the region of Turku and Southwest Finland.

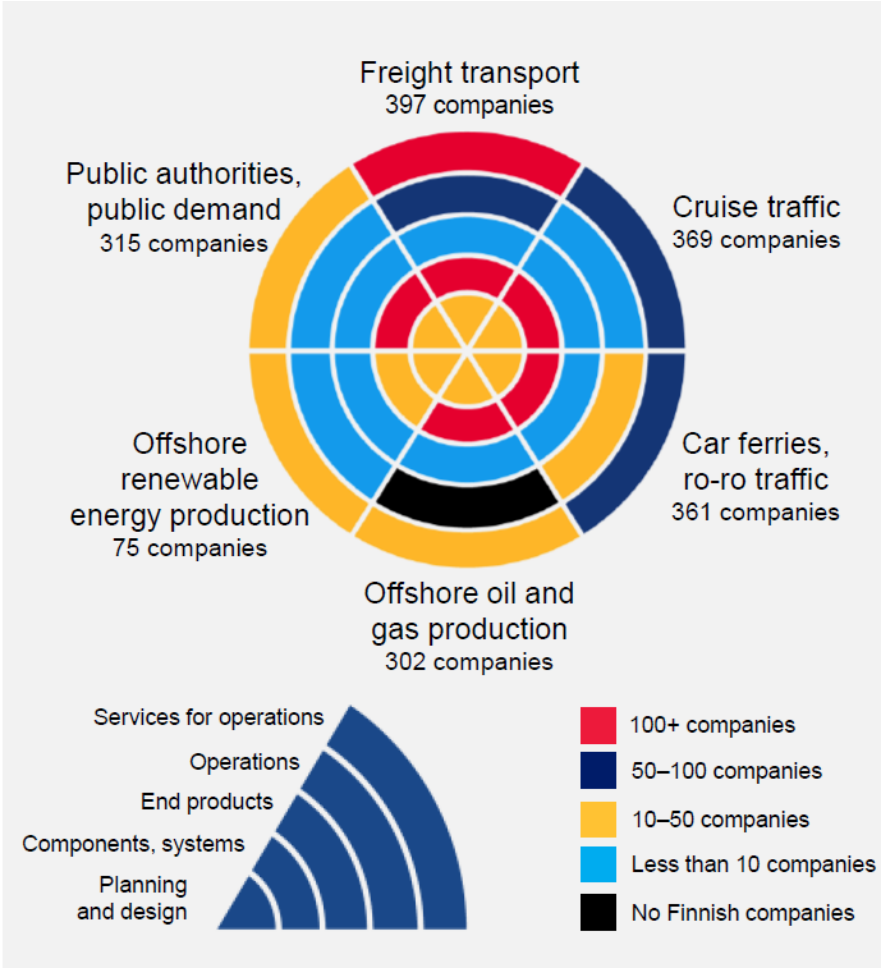
Universities and Schools. Turku University of Applied Sciences, University of Turku Åbo Akademi University have all focused maritime as one of their strategic research areas.



Picture 8. An Overview of relevant actors for Maritime Industry in Southwest Finland Region.

4. SMEs competitiveness by internationalization

As seen on the Picture 9 the Finnish maritime cluster is active in almost all market segments and parts of the value chain. Some companies deliver services to a single market, while others operate in multiple markets. Operating in many market segments is a strength: the sector will remain stable even if the outlook for one market is poor. Many marine industry companies have a strong foothold in global markets and renewable energy is a strong growth sector.



Picture 9: Maritime cluster companies in different markets (University of Turku 2016)

Marine industry is one of the most internationalized and global business branches in the Finnish economy. The customers all practically (ship owners, shipping companies etc. are International. Meaning that most of the companies have to understand at least the basis of international business and business environment.

Drivers of the marine business networks are mainly global multinational companies, either Finnish or foreign based located in Finland. Especially the shipbuilding industry has strong and wide supplier network in Finland. The Finnish marine industry bounds together also strong network of middle and small size companies that increasingly extend their business internationally. Shipping business is not that important as in many other countries Finnish marine industry companies some 80 percent does business internationally and 90 % of the value of maritime technology industry is imported.

SMEs have been participating in international fairs very actively in recent years. One reason is very active role of several public authorities (eg. Finpro) and projects.

Finpro.[1] Finpro helps Finnish SMEs go international, encourages foreign direct investment in Finland and promotes travel to Finland. Finpro is a public organization with no regional elements. Finpro has had for several years a Programme called Maritime and Offshore from Finland. The programme is for Finnish companies operating in the shipbuilding, offshore and marine technologies and construction sectors. Maritime and Offshore from Finland is a Finpro growth program supported by the Ministry of Employment and the Economy.

The goal of Maritime and Offshore from Finland is to increase international business related to the program. It is done by activating Finnish companies to internationalize and help them reach major shipbuilding, oil and gas projects around the world. The aim of the program is to network Finnish companies and thus to provide a common platform for effective access to the world and to increase the awareness of Finnish companies. The program will give more visibility to Finnish marine industry expertise and will acquire investments in Finland. Finpro don't have funding, grants or subsidies, but only market analysis and fact finding trips and short-term consulting.

5. SMEs competitiveness by risk sharing

Support for SMEs and Public funding – Public organisations

Public innovation policy will have a significant impact on the future of the maritime cluster. The support mechanisms are mainly national and regional only to some level. Support is focused mainly for SME's but large companies can have support when acting crucial partner in supply chain (eg. maritime companies in shipbuilding). The companies have been developing competence pools/clusters, they have learnt to work together and shared risks and paid more attention to intangible resources and intellectual property rights. That is seen in business but mostly in RDI projects. Cooperation can only come about in a fruitful innovation environment. In ever-more complex world of fewer borders, the production of competitive innovations needs more multi-dimensional networks in which knowledge, skills, abilities, needs and interests can connect.

The innovation system grounds on collaboration between companies, universities and research institutions, and public innovation agencies. The industry has jointly invested in marine-specific R&D-programs and innovation platforms in all levels between international and local.

[1] Finpro and Tekes merged to become Business Finland in 2018.

The main public authorities are:

Finnvera. Finnvera is a specialised financing company which is 100 % owned by the State of Finland and is administratively placed under the Ministry of Economic Affairs and Employment. Finnvera provides financing for the start, growth and internationalisation of enterprises and guarantees against risks arising from exports. Finnvera offers loans, domestic guarantees, export credit guarantees and other services associated with the financing of exports.

For export and home credits there are two separate export credit agencies (ECAs); Finnvera and its wholly owned subsidiary Finnish Export Credit (FEC). While FEC offers loans guaranteed by Finnvera to buyers of goods and services from Finnish exporters, Finnvera offers guarantees for loans offered by Finnish Export Credit, banks and other providers.

In practice, Finnvera promotes in particular the activities of SMEs, the exports and internationalisation of enterprises, and regional policy goals. Finnish Export Credit grants financing for export and ship credits based on the OECD Arrangement on Officially Supported Export Credits. Finnvera always requires that there is a committed take-out financing in place prior to the drawdown of the construction loan. Finnvera provides buyer credit guarantees, which are credit guarantees to the commercial lenders to cover the risk of the shipping company buying the vessel built by the Finnish shipyards. FEC financing always requires that there is sufficient Finnish interest involved (ships built mainly in Finland), and there is a co-operation and assignment agreement with the arranging bank who negotiates the credit agreement, administers the credit, its securities and the Buyer Credit Guarantee for the entire credit period.

Tekes – Finnish Funding Agency for Innovation[2]. Tekes aims to:

- create opportunities for global growth
- promote customers' renewal
- support upcoming business ecosystems

The main target group is businesses who are seeking renewable growth from international markets and have the desire and ability to succeed. There are three types of funding: loans, grants and investments. The maritime industry has a long tradition of cooperation in

[2] Finpro and Tekes merged to become Business Finland in 2018.

RDI-activities. For instance, a number of Tekes – Finnish Funding Agency for Innovation funded technology programmes have been finalized or still on-going:

- Shipyard 2000 (1991)
- MERIKE (2004–2007)
- Arctic Seas Programme (2014-2017). Several RDI project together with companies and universities

The most recent RD programme for maritime industry by Tekes has been Arctic Seas Programme. The main objective of Arctic Seas was to increase the maritime industry related RDI projects. Arctic Seas programme focused mainly on 1) cleantech, and the reduction of emissions (e.g. and low emission fuels), 2) Digitalization (information and data analytics, (e.g. monitoring, testing, risk management), and 3) Harsh conditions knowhow and test beds. The programme started in 2014 and to ended in 2017 with a budget of EUR 100 million funded by Tekes (EUR 45 million) and by private companies (EUR 55 million). This programme includes projects creating solutions increasing energy efficiency e.g. piloting large scale rotor sails, simulation and optimisation of ship energy flows as well as projects creating tools for enhancing transparency of the environmental footprint of shipbuilding activities. By the end of the programme, 155 projects will be carried out through the Arctic Seas Programme.

Some examples of Arctic Seas Projects e eg.:

One Sea Ecosystem Project. One Sea is a project for autonomous vessels and automation. The objective of the ecosystem is to create the world's first autonomous marine transport system to the Baltic Sea. There are almost 80 companies in the ecosystem through Finnish Marine Industries Association an about half of the ecosystem's funding comes from Tekes – the Finnish Funding Agency for Innovation. (https://www.dimecc.com/dimecc-services/one-sea-ecosystem/).

Ship Recycling in Finland - Demonstration project. International requirements for solid and environmentally sustainable ship recycling globally increase; the problem is that just a small part of the end-of-life vessels globally are recycled safely in terms of human health and the environment. With tightening requirements and changing approach worldwide, as well as an escalating number of end-of-life vessels, there is an increasing need for a sustainable ship recycling in Europe. Along with internationally increasing demands – ships owned or flagged in some EU member country are actually allowed to be demolished and recycled only in the EU certified yards - for ship recycling in a sustainable way possibilities of ship recycling increase in Finland. The demonstration project of recycling an end-of-life

ship at Turku Repair Yard gave more detailed information of all phases of the recycling a ship in a sustainable way, including its profitability commercially.

Sustainability and Transparency in Shipbuilding Networks SUSTIS II project. SUSTIS focused on collecting, combining and utilization of sustainability information of materials and manufacturing processes for creating sustainability based value in shipbuilding. The goal is to 1) expand the use of sustainability arguments in shipbuilding business from operational use to the whole life-cycle starting from raw materials and working conditions and 2) generate new business through opening the sustainability data.

The *Rotor Sail Solution* is a modernized version of the Flettner rotor – a spinning cylinder that uses the Magnus effect to harness wind power to propel a ship. When the wind conditions are favourable, Norsepower Rotor Sails allow the main engines to be throttled back, saving fuel and reducing emissions while providing the power needed to maintain speed and voyage time. Rotor sails can be used with new vessels or they can be retrofitted to existing ships. The Norsepower Rotor Sail Solution was installed in November 2014 on board and will be installed on board of eg. Viking Line passenger vessel. Based on the independently verified results, the technology has potential for fuel savings of up to 20 for vessels with multiple, large rotors traveling in areas with favourable wind conditions.

The other interesting Programme by Tekes is Smart Energy programme 2017- 2021
The goal of the Smart Energy Programme by BusinessFinland is to promote Finland's role as forerunner and testbed of smart energy solutions, supporting innovations and export networks through the establishment and development of a strong competence base. The other goals are promotion of the birth and growth of new companies, and the use of digitalisation, Internet of things, artificial intelligence and Internet of energy etc. This programme began in 2017 and will continue until 2021.

Teollisuussijoitus (Tesi) (Finnish Industry Investment Ltd). Tesi is 100% owned by Finnish State, provides financing aiming to promote growth and to develop Finland's venture capital industry. Tesi can provide temporary funding in equity. Tesi has been active in maritime industry twice in recent years. Tesi's investment policy requires that Tesi remains a minority shareholder and has an exit strategy. Targets are companies which need capital for growing, networks and reputation, and increasing shareholder value. Tesi provides financing based on its investment policy and the several criteria: eg. Tesi invests only to profit-seeking limited liability company (Ltd), never more than 50 %, and and Tesi specifies exit target in advance.

The Regional Centre for Economic Development, Transport and the Environment (ELY Centre). ELY Centres are the most significant regional authorities as granting EU and

national funding. ELY Centres grant support from the following funds: European Regional Development Fund, European Social Fund, European Agricultural Fund for Rural and European Fisheries Fund. Funding is always granted on a discretionary basis, and different types of funding are available for funding in various forms, which the applicant and the project must fulfil.

SME's can apply for funding to develop their business activities from the regional ELY Centre in their area. A company development allowance may be granted for a company's long-term competitiveness improvement project, which have a significant impact on the company's: growth, technology, internationalization, productivity or business knowledge.

Granting a grant is subject to an assessment of the company's ability to continue to be profitable and the assistance is estimated to have a significant impact on the implementation of the project. Recently ELY centres have had relatively good funding for maritime training, competence building. All these organisation are under Ministry of Employment and the Economy. MEE is the managing authority of structural funds in Finland and it operates mainly Through ELY Centres, Finnvera, Business Finland (Tekes, Finpro) etc.

The Regional Council of Southwest Finland. The Regional Council of Southwest Finland is one of Finland's 19 regional councils. Their role is to operate both as regional development authorities and as planning and lobbying organizations. The Council is responsible on a regional level for land use planning. The Council also formulates a long term, strategic Regional Scheme, and a Regional Programme that is reviewed every four years. Regional Councils have a minor role of granting the funds but the objectives of the Structural Funds are based on the strategic action plans of the regions.

DIMECC – Digital, Internet, Materials and Engineering Co-Creation – Ltd. is a non-profit company (www.dimecc.fi). Objectives of DIMECC Ltd. are in long-term change of company-university cooperation, knowledge creation, and innovation activities' impact rather than in financial perspective. The main shareholders of DIMECC are Finnish universities and technology industry companies. Science, Technology and Innovation corporation DIMECC Ltd coordinates several public and/or private funding projects related to maritime technology.

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