

Croatian Shipyards Competitiveness

Feasibility Study

CRONoMAR 

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The mission of the Study of Croatian Shipyards Competitiveness has been to determine the product range, quality of the products/vessels, business models of the shipyards, delivery time and their supply and market channels. All mentioned was seen through the eyes of "being competitive globally".

The study has identified strengths and weaknesses of the sector, as well as some recommendations related to possible further development and new business opportunities at the end of study.

Shortly, recommendations for further development of the sector are as follows:

- *Development of joint supply channels – Professionalizing the purchasing functions*
- *Series production to improve competitiveness and reliability*
- *Create a professional ship design and engineering company*
- *Setting up of maritime equipment cluster(s)*

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2 Introduction

The main objective for CroNoMar is to identify interesting business opportunities, and to try to implement them in business-relations together with interested cooperating partners in both Croatia and Norway.

CroNoMar's goal is to identify potentials for business improvements, and markets for new products and services in marine and marine sector, and to participate in processes to commercialize these new business propositions. The end-result shall be prosperous new jobs and activities in Croatia.

CroNoMar is spending considerable resources on stimulation activities and studies in order to identify and generate deal-flow of new commercial ideas and business opportunities in Croatia.

The types of stimulation activity will be:

- PR and publicity activities to market our services and contribute to an improved business oriented culture and attitudes in the region. Establish good relations to relevant public and private development agencies where potential idea-holders seek assistance and contribution
- Proactivity towards national R&D-institutes, educational institution and students from the region to be trained in entrepreneurship and look for marine relate business opportunities during their studies
- Establish proactive cooperation's with existing business communities, national and regional public authorities, with financial and knowledge development organizations, branches, clusters, unions, associations, etc, in order to highlight non-released potentials and opportunities for new businesses and new business models, and jointly take new ideas into:
 - Feasibility studies
 - Pre-projects
 - Development projectfor further development and evaluation as new business opportunities

The prime objective from CroNoMar with feasibility studies is two-sided:

- Identify new marine and marine business concepts that are relevant as new competitive products and services to be produced and marketed from Croatia.
- Identify cooperative partners in both Croatia and Norway that have interest and capabilities to be our partners in such commercialization.

A secondary result is that these studies very likely will identify considerable improvement potentials by upgrading the existing structure and operational focus of integrated business -branches and –sectors. Such business opportunities have the greatest potential but are very demanding and can only be achieved by long term close cooperation with all parties from individual private companies and local and national agencies and policy makers.

This feasibility study will focus on Croatian Shipyards Competitiveness. Our objective is first and foremost to make an overview of the sector. In addition we want to identify both challenges in the sector and willingness and ambitions for improvements in order to make the sector and the individual companies more competitive. CroNoMar has a special focus on possibilities and opportunities for update of business models in order to improve the competitiveness of the sector, and thus to make it more attractive for new customers and for expansion of technical qualification. New new-buildings and new services are a part of this.

Study will discuss supply channels, working hour rates, production effectiveness and general business models in Croatian shipyards. CroNoMar has been visiting many shipyards, institutions and engineering companies, and at the same time have discussion with potential clients of those shipyards.

Croatian Shipyards Competitiveness

CroNoMar's role as an innovation consulting company is to actively assist Croatian Marine and Maritime industry, to become more globally competitive. This can be achieved by introducing new products and services and new business models in order to achieve such competitiveness.

New Business models can be new ways of designing and producing, specializing inside the existing companies, new cooperation models amongst highly specialized and productive companies, improved subcontracting, improved purchasing etc.

We have been challenged for 6 months on how to create Croatian Shipyards competitive in global perspective regarding particular project, where biggest competitors are Chinese and Norwegians. At the end, after six months and three tenders on that project, we finally manage to create one Croatian Shipyard competitive. In this moment when we are finishing this feasibility study Croatians are starting to build first vessel from that project. This is rather small catamaran vessel but we consider it just as a first step in whole role of new vessels to be built in Croatia for Norwegians. We already start another project of bigger steel vessel and for this vessel competitiveness still has to be created. Our ambition is to create Croatian shipyard competitive, and with competition to bring more new-buildings. Also we aim to increase complexity of those vessels step by step, starting with most simple vessels and then increasing complexity with each next vessel.

This study will overlap on some extends with "Marine Equipment" study. In that study we were talking about marine equipment producers in Croatia and their competitiveness globally. To be able to create shipyards competitive all supply channels of materials and equipment have to be competitive. And then, not only supply channels but also effectiveness of production and subcontracting in shipyards is what will create competitiveness.

So far CroNoMar has placed several tenders for building of aluminium and steel vessels where those tenders were biggest source of information in this study.

3 Shipbuilding Sector in Croatia

Croatian is a country with long history in shipbuilding and Croatian shipyards were among leading ones 30 years ago. That was the time of Yugoslavia and all shipyards, just like whole economy, was state owned. In those times macro economy of whole country was on high level when it comes to competitiveness, competence and strategy. System of national economy was very look like big corporations (Hyundai, STX, etc.) these days, where supply “from the house” is supporting production of “the house”.

With breakdown of Yugoslavia, Croatia started to change its own system from socialistic to capitalistic one. With some additional war activities this change came out of control, and result was and is now non-competitive economy. This reflects to the topic of this study with non-competitive shipyards, where shipyards are mostly state owned and management doesn't have real responsibility. Private goals of management are not overlapping with shipyards goals.

Taking a look from what kind of new-buildings are getting out from Croatian shipyards, it is clear that there was no improvement in product complexity (vessels) or in production processes. Shipyards in Croatian today are building rather simple products, not coping with new technologies or new materials. To change product range (vessel type) in order to adjust production and sales with market demands is a job where some efforts have to be involved towards project design, production technology, and supply and market channels.

The most of the managements in shipyards are not ready to aim in that direction, but rather became middleman or subcontractor to shipyards. Many of shipyards personnel with higher competences quit their jobs in shipyards and become middleman either in supply, or in sales.

From the point of supply channels, many of suppliers are from neighbourhood and vessels are built with negative balance sheet. This is result of makers lists created on non-market competitiveness conditions. Some different interests than competence and competitiveness are criteria when creating makers lists.

Significant numbers of engineers run away from Croatian shipyards to work in China or South Korea. Mostly these are young highly educated and highly motivated people who cannot reach their ambition in Croatian shipyards either in positions or financially.

4 Creating Competitiveness from “New-Building” Project

CroNoMar was creating competitiveness together with Croatian shipyards through new-building projects. Even that we, at this moment, have two new-building projects on go, we will refer to first one CroNoMar start in June 2009.

Aluminium working boat project

The role of CroNoMar in this project was to find quality and professional company which is able to fulfil requirements from the tender documentation, which is able to deliver requested vessel in required period and which have knowledge and experience for such job.

Norwegian customer from this tender is already building the same vessel in China and its business plan is to build series of vessels with yearly production of 10-20 vessels per year. As a business strategy, customer is looking to find alternative place to build vessels, with objection to diminish exposure to risk of building series of vessels in one shipyard or in one country.

This project is about to build aluminium working boat for Norwegian aquaculture industry. On yearly base Norwegian market is buying some 30-40 aluminium working boats for their aquaculture industry. These are simple, small boats built for Norwegian in Norway and China. The only challenge for shipyards is how to build in aluminium, since from technological point this is more complex that to build vessel in steel.

From non competitive to competitive in six months

First of all CroNoMar has been aiming to the competitive offers from Croatian yards in order to fill up their order books and thus contributing to their activity, turn-over and profit. If offers are not competitive, CroNoMar has been eager to go into more details in order to identify areas where Croatian yards lose their competitiveness. This is done in order to offer the bidding yards positive feedback on how to improve their competitiveness and thus hopefully be in better competitive conditions in later similar occasions. CroNoMar is also keen to use this bidding process to identify activities and topics that can contribute to improved competitiveness of Croatian yards in general, and to identify activities where CroNoMar can actively participate together with the Croatian branch in setting up new functions, activities or companies in order to improve the before mentioned competitiveness. Main look will be to identify competitive supply channels, business model and production efficiency.

First tender for mentioned aluminium boat we placed in the end of June. At the beginning of this tender we have challenged short period of time in which we were expecting offers to come. Feedback from shipyards told us that such a short period was too optimistic, and not realistic for Croatian supply system.

We are mentioning supply channels since they were bottleneck in bidding process. Submitting tender documentation shipyards start to look for suppliers in Croatia where those suppliers didn't respond in expected short time. Slow response from suppliers results with speculating on equipment/material price in shipyards. Shipyards place their offers where partly they had data to base that offer on and partly data was assumed. Assumption always has some additional margin as backup.

When the final offers came, they were not competitive and some of them came after deadline, thus Norwegian customer didn't want to consider them at all. Big discrepancy in six offers was from 410.000 – 646.000 €, and we expected price in range of 400.000 €. Credibility of shipyards has to be tested when it comes to technical ability and competence and financial strength to build a vessel.

With offer price above expected and short period to test building ability, CroNoMar decided to drop this tender and prepare those shipyards for next one. We have asked each of them to provide us with price range for each equipment and material from tender. Our intention was to check where the strengths and weaknesses in price structure were, and to help them to find market price or equipment and materials. From six bidders only one was willing to share that information with us and even that one did it because of personal relations we had with him.

Anyhow we verified provided information and conclusions were as follows:

1. Material price (aluminium) was almost double than world market price
2. Engine price was 2-3 times engine price in China, where customer has supply channel
3. Working hours was double than we expected. Expectation was 5000 working hours and offer was 10000+ working hours
4. Subcontracting of aluminium cutting and aluminium welding was overmuch

We provided this shipyard with CroNoMars' feedback, expecting him to be able to reply on next tender.

In **second tender** we have asked two shipyards from first one and two new shipyards to come with their bids. This tender was even shorter because Norwegian customer was unhappy with Chinese shipyard and he wanted to start to build vessels in Croatia as soonest as possible. The same problems like in first tender and we ended up with building vessels in China.

For **third tender** we decided together with Norwegian customer that first vessel to be built in Croatia should be without final customer and should be build on speculation to test ability of Croatians to build such a boat with positive sum-up, in expected time frame and with expected equality. We narrowed bidding process on two shipyards and ended with one which is now building first aluminium working boat in Croatia.

An overview of three mentioned tenders was given to describe challenges and the way we approached to them through the time period of six months.

Improvements in bidding

In six months that we needed to create competitiveness together with shipyards, we managed to improve on following issues:

1. Material, which in this case is aluminium, has to be ordered on global market instead of ordering it from domestic supplier. When we placed first tender aluminium price to buy it from sub-suppliers in Croatia was 4.8 €/kg. At the same time supply price of aluminium from Norway of China was 2.7-3.1 €/kg. This 50-80% price margin has big impact on final price of vessel, knowing that material is some 10% of ship value.
2. Purchasing of equipment has to be done on same model like material. CroNoMar assistance was very helpful in creating competitive price in tender. As an example engine price in Croatia was double than in China. We found out that Croatian bidder were looking for equipment locally. This Croatian practice is killing competitiveness and it gives swing to domestic suppliers when it comes to price margin.
3. Welding was big problem from the beginning. There is too few aluminium certified welders in Croatia, most of them are working either abroad for high money or they work as freelancers creating their market price based on shortage of qualified working power in Croatia. Thus welding has to be done in the house, and welders should be trained and certified instead of subcontracted.
4. Operations management regarding building effectiveness has to increase. It means that working hours should be dropped down from 10.000 to 5.000 per boat. This drop down of working hours can be only done with high effectiveness of production, where planning at the beginning is crucial. In China they need 15.000 working hours to build such a vessel and one way how to be competitive is to be more effective compared to Chinese. That's why Norwegians are building it for 3.000-5.000 working hours.
5. Understanding of product, which is in this case vessel, is also crucial for scope of work evaluation. One of the bidders placed 20.000 € for interior, where in this vessel there is almost no interior. That's why we took two best bidders to Norway, where they were able to see such a vessel already built in China. Understanding of product complexity or simplicity is very important in price structure.

6. When we come to the way of financing this kind of new-building is considered as serial production, where only payment customer done is upon delivery. For that reason shipyard have to come with money for material and equipment upfront. Due to weak financial power, shipyards in Croatia usually launch bank loans for that purpose. Information we got from one of the bidders was that 10% of vessel price he would need for financing. Just like four mentioned links in uncompetitive chain, this one is killing final price. Probably bidder is launching whole loan at the beginning of building, instead of several instalments directly connected with building schedule. Offer for financing, which we received from one Croatian bank, was some 3% of vessel price (all operational cost included).

These were improvements where CroNoMar was actively involved, helping Croatian shipyards to become competitive. Feeling is that all Croatian shipyards have the same problems when it comes to competitiveness.

5 Delivery terms

The production is today both the final product and the associated documentation where the latter has become increasingly important. In specialized and high-cost markets there are increasing requirements to document both the final quality and operational matters as well as origin and tracing of materials used, working/labour conditions both at own premises and of all sub and sub-sub suppliers. The production is thus just as much logistics as production, qualifications and routines/procedures of personnel at own premises.

Project oriented production of single products is today less relevant for shipyards. In order to obtain proper quality and efficiency, shipyards must aim at standardized operations. This means more investment in standardization of working procedures in order to make production processes most efficient and repetitive.

Croatian shipyards are more oriented /value high quality of hand making/craftsmanship instead of concentrate to production routines and high effectiveness/utilization of shipyard. They have to aim to decrease working hour per project, where usage of qualified work power should be priority instead of increasing qualification of each individual person in shipyard.

In mentioned project of building aluminium working boat in one of Croatian shipyards we face the problem where project manager is at the same time director of shipyard. This way of handling project is prolonging delivery time of this vessel, since there is no project manager who is devoted to the project. This person should push-it each day getting activities start at time, as it has been planned on the beginning of the project.

Being late on delivery, just like to build a boat longer than competition, in other words means not been competitive.

6 SWOT Analysis

<p>Strength</p> <ul style="list-style-type: none"> • Strong shipbuilding tradition • Developed shipyard infrastructure • High quality final products • Cheap labour compared to productivity and quality • High qualified engineering human power 	<p>Weakness</p> <ul style="list-style-type: none"> • Shipyards are beyond global trends of new products and technologies • Non proactive management • Lack of proactivity in supply/sales departments • Weak marketing channels • Weak networking channels • Low motivation/devotion of working power • Non supportive national strategies and regulations
<ul style="list-style-type: none"> • Create global purchasing and supply channels to replace domestic channels • Serial production for those kind of products which can be considered as such, to increase effectiveness (aluminium working boat model) • Open relation to global market and use CroNoMar as entrance gate to Norwegian market • Establish professional management to replace old traditional/political management system 	<ul style="list-style-type: none"> • Cheaper labour cost for same productivity from eastern countries • Non reliable national strategies and regulations • Lack of technology transfer centres to connect R&D's with businesses • Non developed market strategies • Business models oriented to products and not to customer requirements
<p>Opportunities</p>	<p>Treats</p>

7 Conclusions & Recommendations for Development of Sector

7.1 Conclusions

The idea of this study was to analyze and test Croatian shipyards competitiveness in global perspective. Competitiveness was tested through several aspects in shipyards, where all of them are taken in consideration:

- Quality of product/new-building
- Building period/delivery time
- Delay with delivery
- Price of product/new-building
- Ability to place offer in reasonable time frame

Further on, direct contact with some shipyards was established in order to test their way of manufacturing, business models, supply and market channels and openness for business development in future.

The shipbuilding industry in Croatia has basically 3 main challenges. These are as follows:

- The industry must be competitive in order to win contracts. The purchasing market is global and the same terms must be anticipated both internationally and domestically.
- Development of global marketing includes also establishment of supply channels and after-sale support, and it will take a number of years to develop such stand-alone structures
- There is a need for trustworthy and competitive financing channels and credit lines for export. Banks and guarantee funds must be available with globally accepted terms.

CroNoMar can, to a certain extent, participate in different ways to cope with these challenges and build relations and references towards the shipping and shipbuilding business environment in Norway including relations towards individual companies in the sector and/or toward ship-owners/brokers from Norway.

So far CroNoMar had two different projects for new-buildings in Croatian shipyards.

One of them was aluminium working boat where we experienced Croatian ship builder's habits of purchasing raw material and marine equipment on local market. Such a way of purchasing helps domestic traders to increase their profit, but it kills final price of the vessel.

On working boat project we provoked local ship builders to try purchasing on global market. At the end such a model resulted with signed contract for new-building. It has to be mentioned that this process of creating competitiveness took half a year of time and we are still assisting/consulting particular shipyard on how to manage to implement series production.

Second project is related to bulk carrier vessel of 50+ meters. This project is still in tendering phase, where first tender was out of to be competitive. For this kind of vessel mostly state owned shipyards are able to build it, but at the same time, they still have some internal strains and regulations which kill their competitiveness.

For example; we faced tendering problem in the first tender, because only one of those shipyards were able to apply to tender due to rules set up by "Croatian Shipbuilding Corporation". All state owned shipyards are members/part of that organization, and after receiving tender documentation they have to apply to that organization with new-building project number. In that case we have situation of "fastest finger" because all others are not able to apply to the same tender. To avoid this rule we are now placing tender for same vessel with different new-building project number.

There are some indications that "Croatian Shipbuilding Corporation" will give up from that rule and CroNoMar is at present working on that topic.

Also CroNoMar wouldn't make any recommendation related to public/political defined shipyards, but more recommendations will be oriented to business models of shipyards and ways of how to improve effectiveness within economical/business frameworks.

Seen from CroNoMar we will recommend that the following topics are to be addressed both by the sector as such and by individual shipyards in Croatia that want to orient themselves in such directions.

7.2 Recommendations

Join Supply Channels – Setting Up Purchasing Company

When it comes to supply channels Croatian maritime equipment produces, together with maritime equipments suppliers are using different supply channels, approaching to the small Croatian market and make them uncompetitive with global players. Further to mention, global players are winning bigger contracts and domestic small producers stays on small domestic market.

Experience shows that Croatian shipbuilding industry and marine equipment manufactures loose considerable part of their competitiveness by non professional purchasing or sub-supplies. In Croatia, purchasing channels are weak and there is much space left to increase quality of those channels. Croatian purchasers are doubling product final price with profit margins up to 100%. This results in non-competitive final price and losing of customers, where the normal profit margin would be expected on level of 10-20%.

CroNoMar would like to assist to improve purchasing if there is interest among the other players in Croatia either in between suppliers or shipyards. Therefore we suggest that some ways of purchasing could be established and we would like to be a partner or consultant for this topic:

- To improve internal competence and routines in each yard through developing and educating purchasing department. CroNoMar can provide education courses in that field as a consultancy service.
- To joint effort amongst several yards to set up a purchasing company and CroNoMar could be a 20 % partner in this new business company.
- Establishment of a web-site for the shipbuilding branch for buying marine equipment on world market, where improvements are distributed amongst the web and the purchasers.
- Assist to improve competitiveness via taxation regulations.

CroNoMar has already done several studies where we were coping together with Boatbuilding Cluster, Affiliation of Marine Equipment Manufacturers and also we managed to make Croatian shipyards competitive when it comes to aluminium boats production. Together with experience from Norwegian shipbuilding sector and already mentioned feasibility studies and project in Croatia, CroNoMar can be active partner for starting up a Purchasing company.

CroNoMar would like to discuss with other players in Croatian maritime equipment industry, to define business model and set-up joint Purchasing Company, where CroNoMar would like to be a partner with limited ownership of 20%.

Series Production

For smaller type of vessel series production is economical one. Such a type of production can find role model in car production lines. First unit/vessel is mostly expensive to be produced where each next unit decrease its price with this series effect.

So far many of shipyards are much diversified when it comes to product range or services they offer. With this model of shipyard/production management, they are far away to be competitive. Even if it's hard to give up from some of the vessels from own portfolio, focusing on only few / one type of vessel will increase competitiveness.

A series production means more repetitive production, less prototyping, less failure and more reliable/robust product for less cost.

CroNoMar already manage to create a series production of small aluminium catamarans in one Croatian shipyard, and in same direction CroNoMar is ready to assist to other shipyards as well.

CroNoMar would like to discuss with some shipyards how to find ways to sell series of vessels instead of selling one-off type vessel. For those shipyards CroNoMar would like to be consultant, helping them to reorient their business model to series production. Focus than would be reoriented from solving engineering problems on each one-off new-building to the marketing and sales channels.

Create a Professional Ship Design and Engineering Company

Based on the facts that Croatian shipbuilding industry at this moment is not performing as the competitors does, where Croatians are losing their competitiveness in many segments of the value chain, from design to finished products. With such a performance they would have to find new business model for their services/products, where Professional Ship Design and Engineering Company can be one of the solutions.

Such company could than take a leading position as follows:

- Design purpose vessels where a series can be foreseen, but at the same time specialize shipyard industry with advanced equipment as part of design/equipment packages.
- Purchasing of equipment in global competitive market with developed professional purchasing organization.
- Sell design and packages to yards and customers.
- Make a system where most of the ship value is created by suppliers with as few as possible middleman in between purchaser and producer.

Croatian shipyards have quality engineering resources and all of them are used for internal purpose of shipyards, designing ships and creating blueprints for their own shipyards. If they show willingness to raise that engineering potential on a higher level where their final customers will be sitting all over the World, CroNoMar could like to play a role creating such a company.

Setting Up of Marine Equipment Clusters

The connections and relations between marine equipment producers so far is mostly competitive, and they are not familiar with joint venture opportunities where joint commitment and cooperation could play important role in order for joint and cost-sharing further development of each individual company.

Affiliation of Manufacturers of Naval Equipment under Croatian Chamber of Economy exists. This is a good start, but this organization is a kind of volunteering base. CroNoMar consider that there is a need for more commitment and professional organization would be needed in order to make one or more stronger groups. Such groups must be organized according to the objective like for instance:

- A group for joint product development should consist of partners within the same product family and within the same technologies in order to take profit of joint development of product-know-how, customer/application requirements etc
- A group for joint marketing should consist of companies with complementary products but same potential markets/applications in order to take profit of providing through same market channels a whole product family. For instance Propulsion systems, Cargo handling equipment etc

Cluster development is presently popular political phrase, and such groups might very well be called clusters. Then there could be clusters for product development where Universities and R&D institutes were involved, while marketing clusters would more involve external partners like trade and promotional councils/agencies.

The present Boat-building cluster might be too diversified and not enough focused. It is likely that there should be one or more clusters for marine equipment producers. In the domestic market, the communication between marine equipment producers and ship builders is weak and both parties should listen to each other when developing new products.

Marine equipment cluster has to be set-up in order to speed-up and develop international and domestic activities of marine equipment manufactures and marine equipment traders with objective to be more competitive and more present on global market. Such approach will be supportive to Croatian shipyards creating final vessel price more competitive. Therefore, initiative should be created from Croatian shipyards, where they are final customers of such a cluster and they must have interest in creating of marine equipment cluster.

CroNoMar can be an interesting body in formulation of such clusters. CroNoMar can be less dangerous and more commercially focused, having experience that simplifies the processes to create cooperation amongst traditional competitors. CroNoMar would like to discuss with other players in Croatian marine equipment industry to define business model and set-up Marine Equipment Cluster. In new marine equipment cluster we would like to be a partner with limited ownership of 20%.