



OECD Council Working Party on Shipbuilding (WP6)

**Factors affecting the structure of the world shipbuilding industry**

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**Table of contents**

Table of contents.....3

FACTORS AFFECTING THE STRUCTURE OF THE WORLD SHIPBUILDING INDUSTRY .....4

    INTRODUCTION .....4

    PLACING THE SHIPBUILDING INDUSTRY IN AN ECONOMIC CONTEXT.....5

    DIVERSIFICATION AND ATTRACTING INVESTMENT.....8

    FACTORS DRIVING FOREIGN INVESTMENT IN SHIPYARDS.....9

    THE VIEWS OF GOVERNMENTS AND INDUSTRY .....13

    CONCLUSIONS .....17

ANNEX I INDICATIVE LIST OF FOREIGN INVESTMENTS REPORTED IN A THREE MONTH PERIOD IN THE PRESS .....19

ANNEX II CHANGING STRUCTURE OF THE WORLD SHIPBUILDING INDUSTRY .....21

QUESTIONNAIRE FOR GOVERNMENTS .....22

    Question 1 (a): .....22

QUESTIONNAIRE FOR INDUSTRY .....23

## FACTORS AFFECTING THE STRUCTURE OF THE WORLD SHIPBUILDING INDUSTRY

### INTRODUCTION

1. This study explores the rationales that drive the growing globalisation of shipbuilding that has dramatically changed the structure of the industry, especially with respect to the extent and scope of cross-border investments. If ship buyers have benefited from the global nature of the industry (in that they can have their ships built virtually anywhere on the globe), then ship builders are now also benefiting from a growing ability to place their manufacturing facilities in countries other than their own.

2. The first examination of off-shore shipbuilding activities was undertaken in 1996, when a report [*Outward Co-operation of OECD Shipyards C/WP6(96)3*] was prepared for the WP6 by the consultancy firm Shipping Economics and Logistics of Bremen.

3. In that document the consultant identified the following groupings of co-operative activities:

- i.* regular supply of components (*eg*, hull sections)
- ii.* sub-contracting, licensed production
- iii.* technological co-operation and training
- iv.* acquisition of shares in company capital
- v.* founding of joint ventures.

4. Of these groups only numbers *iv*) and *v*) could be considered as significantly impacting on the structure of the industry by giving the investing shipyard a foothold in a foreign location. For their part, the first three are more commercial and operational in nature, although (for example) the transfer of technology could lock the providing yard into an on-going arrangement with the foreign yard.

5. The consultant drew a number of conclusions, of which the following appear relevant to the rest of this analysis:

- Demand for co-operation can come from both sides; shipbuilders in developed economies faced with the problem of high labour costs looked to bring down their production costs, while shipyards in less developed economies wanted to raise productivity, increase output or widen their scope of activity.
- Changes in Eastern Europe in the late 1980s and early 1990s pushed shipyards into a deep crisis, as well as giving those centrally planned economies the chance to be in contact with their market economy counterparts.
- A similar effect followed the opening up of the People's Republic of China.

- The decreasing demand worldwide for military ships led to the conversion of those facilities for commercial production. The permanent oversupply of shipbuilding capacity forced shipyards to either raise productivity or lower production costs to remain competitive.
- The expected halt to shipbuilding subsidies<sup>1</sup> would force shipbuilders in locations with high labour costs to examine all possibilities to reduce production costs.

6. As an overall conclusion, the consultant postulated that the principal winner of this growing co-operation would be China, which had the chance to use its potential to become a leading shipbuilding nation.

## **PLACING THE SHIPBUILDING INDUSTRY IN AN ECONOMIC CONTEXT**

7. In trying to understand the extent and impacts of structural changes in the industry, it would be helpful to place the shipbuilding industry in a broad economic context, in order to examine the relationship between government and the industry, and how global changes may affect those relationships.

8. In very general terms, the reason private companies enter the shipbuilding industry is to generate profits, or at least to diversify and/or broaden or deepen their industrial capability. However, governments are more likely to see shipbuilding as a strategic industry capable of delivering public policy outcomes.

9. While increasingly shipyards are turning to private ownership, in earlier times the industry was considered to be of such strategic and economic importance that yards in many countries were in public ownership. Because of the importance of the industry, the traditional shipbuilding nations supported their shipbuilding industries with financial assistance, particularly after the late 1950s, in order to ensure that they could continue to carry out their traditional roles, despite changes taking place in international trade and commerce. For their part, new shipbuilding nations (starting with Japan) were providing substantial financial backing to establish shipbuilding as major new national industries, a process that still continues.

10. Even when industries are partially or fully privatised, governments rarely lose complete touch with the sector, because of the perceived ability of the industry to have significant economic impacts, and because of its ability to deliver public policy outcomes. This tendency by governments to interfere in the market is the main reason why the objective of bringing normal competitive conditions to the industry is still unfulfilled.

11. Different governments, in different economies at different stages of their economic development will perceive the shipbuilding sector in quite different ways, but conceptually these perceptions could include:

### ***Employment generator***

12. Shipyards have always employed large numbers of persons, and that remains the case, even with the introduction of automation to improve productivity. In particular, governments of newly industrialising economies where heavy industries (such as shipbuilding and steel) are perceived as important first steps into the value-added industrial sectors, see shipyards as particularly effective employment generators.

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<sup>1</sup> This was a passing reference to the 1994 Agreement Respecting Normal Competitive Conditions in the Commercial Shipbuilding and Repair Industry, which was expected to come into force in 1996 but never did.

13. In addition, shipyards require high order skills ranging from welding, fabrication and design to management and commercial activities, and these are also important contributors to national industrial capability. The training of workers provided by the yards is important to the yards to maintain its skill base, but also to governments for the increased employment opportunities that this creates both within and outside the shipyards themselves. In the mid-1970s, the decline in shipyard orders throughout the world led many shipbuilding economies to provide assistance to ensure the continuation of their domestic industries when these were under pressure from more efficient competitors. In some cases this extended to the nationalisation of the industry, in order to avoid politically unacceptable large-scale unemployment.

14. New yards are generally located near areas where workers are plentiful, but also frequently are areas of high unemployment, which of course is helpful to governments by increasing work opportunities to reduce unemployment rates. Commensurately, governments are understandably concerned when shipyards reduce their operations or close down, as this inevitably results in large numbers of workers entering the labour market. A frequent response by government is to offer some kind of assistance as a lifeline to yards to at least partially continue their operations. An example of this was the restructuring of the shipbuilding industry in the 1980s in Europe and Japan which led to significant job losses. As a more recent example, the call for the speedy privatisation of yards in Gdynia and Gdansk (Poland) by the European Commission were fiercely contested by the Polish Government, unions and even members of the European Parliament because of the severe job losses that this would entail<sup>2</sup>.

#### ***Economic kick-starter in depressed regions***

15. When faced with depressed regions the first action by governments is to seek ways of generating employment, so that the “trickle-down” effects can spread benefits throughout the local economy. As noted earlier, shipyards are effective generators of both skilled and unskilled employment. This makes them very attractive to governments, which in turn creates a natural desire for governments to attract and keep shipbuilding activities in those depressed regions, often by offering substantial enticements, ranging from direct subsidies, to tax breaks, regional development aid and other preferential treatment.

16. A secondary, but related reason why shipyards are valuable to depressed regions is that they build a pool of skilled labour in the area, which in turn acts as a magnet for further investment, including foreign investment, keen to tap into the skill base, production facilities and lowers costs associated with the region.

#### ***Contributor to industrial capacity***

17. Most economies, and particularly those that are rapidly developing, consider industrial capacity as a cornerstone of their economic development. In this context, “industrial capacity” is defined as the ability of the national industrial sector to sustain manufacturing of a wide ranging group of intermediate and end products; for example, steel production, car manufacturing and shipbuilding. These industrial capabilities, as well as contributing to GDP are also considered by governments as insulating them to some degree from interruptions – due to wars, social/economic upheavals and acts of God – to external sources of capital and consumer goods. For developing economies foreign exchange earned through shipbuilding can also act as a stimulant to industrial capacity through the expansion of facilities to meet export demand.

18. While the notion of self-sufficiency has rapidly declined in the wake of growing globalisation, there are still strong residual beliefs that some in-house capacity and skills are necessary for military as well as commercial needs – just in case. Shipbuilding falls into this category, hence its frequent status as a strategic industry, especially in developing economies.

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<sup>2</sup> Reported in Lloyd’s List 7/9/07 in the article “Few buyers emerge for Gdynia yard sell-off”, also in Lloyd’s List 22/8/07 “Poland snubs Brussels’ call to shut down Gdansk yard”.

### ***Strengthen technical and technological capability***

19. Although shipbuilding is often regarded as an “old” industry, the design and construction of vessels still requires considerable technical and technological capability, and as such is greatly prized (especially in developing countries) for the downstream benefits that come from access to such technology. For example, employees gain skills that can be readily transferred to other activities, and the technology used in shipbuilding encourages associated support industries.

20. One of the objectives of governments when opening up inward investments by foreign enterprises has been to acquire technological capability, with technology transfers frequently being part of the conditions associated with cooperative or joint ventures with local shipbuilders.

21. Governments generally consider the development and maintenance of manufacturing enterprises such as shipbuilding as crucial to maintain a reservoir of technical and technological capability, and will frequently resist plans to close down such enterprises. In the past, the desire of governments to keep such facilities open and operating has been one of the reasons for the granting of government support that has acted to distort the shipbuilding market.

### ***Defence Capability***

22. This was already alluded to in the last paragraph, but is important enough to be listed separately. Every country/territory with a coastline considers some kind of naval military capability as an absolute necessity. Wherever possible these naval craft should be produced domestically, generally through joint ventures and associated technology transfers.

23. While military naval production and commercial shipbuilding are generally treated as quite separate activities the fact remains that production facilities are to some degree interchangeable, and yards can switch relatively easily from one type to the other. An example of this can be found in the conversion of military yards to commercial production that was common following the political changes in Russia and eastern/central Europe in the 1990s.

24. Therefore, commercial facilities (and their skilled workforces) can be considered by Governments as potential naval vessel producers if the need ever arises, which would add to the weight of argument for their retention even when they are not commercially viable.

### ***Investment Vehicle***

25. Governments generally strive to make domestic conditions attractive to foreign direct investment (FDI) which can stimulate the economy, create employment and enhance industrial capacity. The construction of new construction facilities, or the upgrading/refurbishment/expansion of existing facilities would require considerable capital injections into the local economy, and governments may provide tax, land/infrastructure or other incentives in order to attract those investments.

26. However, governments can differ significantly with respect to the level of ownership and control permitted with respect to those capital investments. Some governments will allow only highly regulated investments in joint ventures with local partners and with majority control held by domestic interests. Technology transfer requirements may also be part of the conditions of those capital investments.

27. At the other end of the scale, some governments will permit 100% foreign ownership and control, while there are, of course, many different combinations and permutations in between.

### ***Public Sector Policy Delivery***

28. For most governments, major national institutions can act as vehicles for the delivery of public policy objectives. Obvious examples of this are postal services in most countries, which, in the national interest of equality are compelled by governments to offer comparable postal services and charges that are the same whether they travel around the corner or to a remote corner of the country. Even when partially or totally taken out of public ownership such enterprises can find themselves with “public service” obligations, intended to meet one or more public policy objectives. Basic telephone service providers have often found themselves in such a situation even as they moved from public to private ownership.

29. For enterprises or service providers that are wholly or substantially publicly owned, it is easy for governments to direct them to meet those public service objectives. For privatised enterprises such obligations can be imposed in a variety of ways, such as imbedding those obligations in licences (such as telecommunications or broadcasting) or through the government retaining some controlling influence on the activity of the enterprise (golden shares or shares with enhanced voting rights).

30. For purely private enterprises the task is more difficult for governments, and the achievement of public sector policy objectives generally requires a “carrot or stick” approach. For example, access to some forms of government support (such as subsidies, R&D support, tax concessions and so on) may be linked to the enterprise meeting some public policy objective, such as employment generation, or establishing facilities in a depressed region.

### ***Profit/tax potential***

31. While profitability is of paramount interest to private sector enterprises this is not always a priority for public sector operations, which may have alternative objectives that are of crucial interest to governments (which have already been briefly outlined).

32. However, one desirable side effect from profitable enterprises is that they generate tax revenues from those profits (as well as any associated industries that the shipyards might sustain) and tax revenues from the earnings of employees. Conceptually, one would expect that if a shipyard is attractive to governments for one or more of the reasons that have been examined in this section, then a shipyard that is profitable and pays income tax would be doubly attractive.

## **DIVERSIFICATION AND ATTRACTING INVESTMENT**

33. Conceptually, most governments would welcome the presence of shipbuilding enterprises in their jurisdiction; in some case even if these were not always economically viable and required some form of government support to remain operation, as long as they helped governments fulfil one or more important policy objective.

34. Therefore, from a public policy perspective some governments find it attractive to encourage the creation of new or expanded shipbuilding facilities in order to exploit the economic advantages that such enterprises bring with them. On the other side, shipbuilding enterprises would also be keen to exploit advantageous conditions to expand their shipbuilding capacity and increase revenue and profits.

35. Until the Second World War shipyards were largely public sector activities, with facilities either nationalised or with governments holding substantial (and often controlling) interests. Customers for those yards were essentially domestic, frequently with shipping lines having long-standing associations with particular shipyards. When investments were undertaken on those shipyards they were generally undertaken in a purely national context, and there was little, if any cross-border investment.

36. In other words, shipbuilding activities were considered to be so strategic and in the national interest that foreign participation of any kind was not permitted. This meant that over time shipbuilding had developed a very inward looking structure, focused only on what was available and feasible domestically. Therefore, if a shipbuilding enterprise was interested in relocating, or creating a new facility with access to low cost labour (for example), then it would look inside its national border; perhaps in a depressed region that might offer some of those cost advantages.

37. However, this picture has gradually changed since the early 1950s, when first governments started to withdraw from direct participation in the industry (even though they continued to support the industry by subsidies and other incentives) and then, just as significantly, foreign investment in shipbuilding facilities became possible.

38. The starting point for this transition was in the 1950s with the negotiations of a 10 year lease of the Japanese yards at Kure by the United States based National Bulk Carriers (NBC). This was the first known significant investment in a foreign shipyard. The NBC shipyard at Kure was the first shipyard to adapt the industrial engineering principles developed in the U.S. for naval production to commercial shipbuilding, which increased productivity in an already modern shipyard. A condition of the investment was that the yard would train technicians from other yards such as Hitachi Zosen and Mitsubishi. The NBC venture was also the starting point of the modernisation of the Japanese shipbuilding industry.

39. This initial step in the transition from purely domestic to foreign investment heralded some dramatic changes to the global shipbuilding sector, and initiated a substantial change in the structural landscape of the industry; the very reason why this study has been undertaken. The opening up of shipyards to foreign participation, investment and ownership has meant that yards could look further afield in order to acquire new skills, lower construction costs and expand their production.

40. Since the first tentative foray into foreign yards, the practice has accelerated rapidly, especially since the 1990s, and there are now many examples of such cross-border participation and investment. As an example of the spread of the globalisation of the shipbuilding industry, Annex I provides a list of such investments drawn from a quick examination of news articles between mid-June and mid-September 2007. The list is not systemic, nor is it exhaustive, but is merely intended to highlight the number, extent and type of cross-border investment mentioned in the press in that three month period.

41. Some of the examples shown have been in place for some time, while others were new announcements or proposals. Significantly, while China is dominant in the list of host countries<sup>3</sup> there are also a number of different economies mentioned as both investment providers and hosts.

## **FACTORS DRIVING FOREIGN INVESTMENT IN SHIPYARDS**

42. In order to better understand the attraction to shipyards of venturing outside their domestic shores, it is useful to explore conceptually the circumstances or objectives that could be expected to drive these investments. While each project would have its unique set of factors that might attract cross-border participation, the key rationales could be expected to include one or more of the following items.

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<sup>3</sup> In early 2007 China announced that it would limit foreign investment in Chinese yards by requiring a minimum of 51% local participation in any ventures, while in September 2007 there were reports that the Chinese government was considering issuing licences (item drawn from Forbes.com on 11/9/2007).

### ***Government direction/encouragement/support***

43. When governments welcome foreign participation/investment, either as part of a broad opening up of the economy or to achieve other, narrower objectives (employment growth perhaps) then it is probably also in their interest to encourage local shipyards to search for, or at least be open to, outside participation. Many governments bid for foreign investments and frequently provide incentives to attract them, ranging from subsidies, to the preferential provision of land and access to infrastructure and special tax arrangements. The availability of such support would of course enhance the attractiveness of localities that may already have features attractive to investors, such as low cost, skilled labour.

44. In such circumstances, governments may also impose conditions on that participation, such as mandatory joint ventures, majority local ownership, technology transfers other similar limitations. The recent reminder by the Chinese Commission on Safety, Technology and Industry for National Defense (COSTIND) that national rules require that the Chinese side should hold at least 51% of any joint venture with foreign partners, is an example of such limitations<sup>4</sup>

### ***Economies of scale***

45. As with most enterprises there are benefits to be obtained through exploiting economies of scale (for example materials, equipment, training etc). Although these are more difficult to exploit when it involves distantly separated shipbuilding facilities, such benefits may still be available, especially if the foreign sites have additional advantages, such skilled labour or the availability of land/infrastructure for further expansion.

### ***Lower Production costs***

46. It could be expected that lower production costs would be one of the main drivers for foreign investment in order to make products more competitive on the world market. While the low cost of labour is generally the principal component, the lower cost of materials and services are also important.

### ***Availability of land and infrastructure***

47. If a long-term expansion of capacity is required, and is not possible in the yard's home location, then the opportunity of expanding in a foreign location may be attractive, especially if there is land available and is well priced (in some circumstances it might be at no cost) and has adequate supporting infrastructure. Emerging economies frequently portray themselves as locations with an abundance of suitable land in their efforts to attract foreign investment; including for shipyards. As an example, Korea's STX Shipbuilding Co. recently announced that its new shipyard, to be built in Dalian, China, would aim to increase productivity and price competitiveness for the company by maximising the cheaper labour and land costs. Its strategy would be to produce simpler vessels at the Dalian shipyard while focusing on high-value ships, such as LNG carriers, in Korea.

### ***Skilled labour forces***

48. Many emerging economies can provide large numbers of skilled workers, which could reduce the cost of replacement and training of workers to the operating yards. This is becoming increasingly important to yards in the more mature economies where skilled workers are retiring in large numbers and

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<sup>4</sup> Reported in Asia Times Online on 6 July 2007.

their replacement is becoming increasingly difficult<sup>5</sup>. In some cases, developed shipbuilder companies can invest in emerging economies in order to secure their technical manpower such, as the Samsung Heavy Industries (SHI - Korea) investment to establish a design and technology centre in India as a 100% foreign-capital entity.

### ***Technology/construction techniques***

49. Shipbuilders that are unable to invest sufficient capital to update their facilities and technology (not necessarily all in developing economies) could find considerable benefits through strategic alliances, technology transfers or joint ventures with more technically capable shipyards. However, there have also been concerns expressed about the longer term competitive advantages gained through such technology transfers by receiving partners, as well as instances of technology being transferred without authority<sup>6</sup>.

50. There may also be opportunities for already technologically advanced yards to expand their capabilities through investment in foreign yards (for example to acquire specialised construction techniques). For example, the Saint-Nazaire and Lorient shipyards, owned by Alstom subsidiary Chantiers de l'Atlantique of France (with a long tradition in the construction of passenger vessels) was acquired by Aker Yards with a majority stake and integrated in its cruise & ferries business area in 2006.

51. In some cases, leading yards might form strategic alliances in the form of joint ventures, equity stakes or technical co-operation agreements, in order to strengthen their worldwide market position. This was the case with Ishikawajima-Harima Heavy Industries (IHI - Japan) and Samsung Heavy Industries of South Korea. These well established yards signed a technological cooperation agreement on super-large liquefied natural gas (LNG) tankers, under which IHI would license tank design technology to Samsung Heavy and cooperate with its South Korean partner in selling LNG tankers.

52. While the normal flow of technology is from mature to emerging economies, this is not necessarily a one way traffic, and there may be instances when yards in emerging economies might be able to acquire technology through investment in (or perhaps even a merger or acquisition of) established yards in the developed economies. An example of such a "reverse" investment was the acquisition of the UK based Swan Hunter Shipyard by India's second largest private sector shipbuilder Bharati Shipyard<sup>7</sup>, which planned to move the UK firm's entire machinery and equipment to green-field yard premises at Mangalore.

### ***Product diversification***

53. Different shipbuilders (and shipbuilders in particular regions) focus on different ship types where they believe they have special skills, experience or other comparative advantages. For example, in low cost economies the initial focus is generally on simpler vessels such as bulk carriers which can be constructed easily and cheaply without the need for advanced technology. In developed economies the focus might be on more technically advanced vessels, to take advantage of greater design experience and higher levels of technology. Others might focus on specific aspects of shipbuilding, such as hulls, in preference to finished vessels.

54. This specialisation, if accessible, may allow yards to diversify their skills, products and market coverage by investing in, or cooperating with, yards in other economies that possess the attributes they are

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<sup>5</sup> For a perspective on this see the Lloyd's List article of 30 /08/07, *Japan yards prepare for decline of skilled workers.*"

<sup>6</sup> "South Korea to plug technology leaks" – *Lloyd's List* 30/08/07.

<sup>7</sup> "Swan shipyard to move lock, stock and barrel to Bharati" – *Lloyd's List* 19/04/07

seeking. Provided there are sufficient synergies then this could be a much more cost effective way of diversifying than starting from the ground up, and for that reason could be a powerful motivation for shipyards to look outside their immediate surroundings.

### ***Increase market share***

55. While an increasing market share is not necessarily a path to eventual profitability, it could be seen as a sign of the competitiveness and success of an enterprise, as well as providing the basis for exploiting any available economies of scale (for example, design facilities or the acquisition/manufacture of certain components).

56. Therefore, the acquisition of, or significant investment in, existing shipbuilding facilities would provide an immediate boost to the market share of the investing enterprise. Alternatively, the conversion of other facilities, such as yards used for naval (military) vessels or the construction of green-field sites, would have a similar, but longer term, outcome. That the increase in market share could be acquired by also exploiting other advantages (ranging from lower costs, to new skills/technologies and government “encouragement”, could make this an attractive proposition for investing entities.

### ***Underutilised shipbuilding yards***

57. When established builders have full order books and fully utilised capacity, the immediate concern is how to expand their shipbuilding capacity. Incremental improvements in efficiency may increase capacity, but this may not be sufficient, and the expansion of existing facilities, or the development of green-field sites, may be too difficult and/or expensive, and in any case these would take some time to come on stream.

58. In these circumstances unused or underutilised capacity at another location (including in a foreign country) may offer a relatively rapid way of increasing capacity to exploit short and medium term demand. This could be achieved through strategic alliances, co-operative deals, joint ventures or mergers and acquisitions.

### ***Outsourcing of ship blocs/components***

59. While in the past traditional shipyards fabricated virtually every component in-house, over time yards have followed all other industry sector by increasingly outsourcing specific components. This has been especially so with respect to specialised equipment such as engines, drive-trains, electronics, interior fittings etc. More recently still, this farming out of ship components has also extended to parts of the main ship structure, where parts of the hull (such as bow sections) or entire hulls may be outsourced. Examples of this are the South Korean shipbuilders Daewoo Shipbuilding & Marine Engineering (DSME) and Samsung Heavy Industries, both of whom currently run operations to produce ship blocks in China, while DSME is also considering the possibility of doing the same in North Korea.

60. Some yards in emerging economies have captured a growing niche market by specialising on such components, and have become targets for investment from foreign yards keen to either lock-in the supply of such components, and/or to have greater control of the cost, delivery time, technology and quality of those components.

### ***Better access to key markets***

61. Many industries attempt to locate themselves close to key markets. A long-standing example of this in another industry sector has been the construction by Japanese car makers of plants in the US, Europe, China and elsewhere to be closer to their principal markets. While shipbuilding is quite a different

industry to motor vehicles, there may nevertheless be compelling reason to establish a presence in, or near, key markets. For many this may be China or other Asian locations; a region which is fuelling much of the world's economic growth.

62. Investments in yards close to key markets may offer greater visibility, products that are more closely attuned to the needs of those markets, and may benefit from support for products that are perceived as being "local. For example, Aker Yards of Norway is taking a strategic position in the Asian market for offshore vessels by setting up a shipyard in Vietnam", which Aker Yards considers will strengthen its ability to serve its international customers in the region, as well as in Vietnam.

## **THE VIEWS OF GOVERNMENTS AND INDUSTRY**

63. So far this paper has looked at the drivers of change conceptually; in other words it has examined factors that *could be expected* to influence decisions of governments and industry in ways which could change the nature and structure of that industry sector.

64. However, in order to better understand the *actual* drivers that influence governments and industry, questionnaires were circulated to all WP6 members, some non-OECD economies and key industry groups, asking them to indicate those factors that they consider to be most important. Copies of the two questionnaires can be found in Annexes II.

65. Delegates should note that the questionnaires are not a rigorous survey, and responses should be taken as indicative of the general views of governments, rather than firm policy positions. Also, because only a small number of responses were from non-OECD members, these views may not be representative of governments in developing and emerging economies, and a more intensive sampling of those governments may provide some quite different perspectives. This may be an aspect that could be further tested in advance of the WP6 Workshop in December 2008, in which it is suggested in a separate document that the changing structure of the global shipbuilding industry be a central theme.

### ***Government perspectives***

66. Given the limitations inherent in the questionnaire responses, it was nevertheless interesting to see that all responding governments still consider the shipbuilding sector important to their national economies, despite such heavy industries now being widely regarded as representing the "old economy" (as opposed to – for example – biotechnology, nanotechnology and IT which are considered as representing the "new economy"). In reality, the reasons for this are not hard to understand, and have been explored in some detail in the previous sections of this document.

67. In summary the views of governments were as follows:

**Table 1.** Importance of shipbuilding as an economic activity

(In order of overall economic importance)

| Item                               | Percentage of respondents considering item as |                  |                      |
|------------------------------------|---|------------------|----------------------|
|                                    | <i>Very important</i>                         | <i>Important</i> | <i>Not important</i> |
| Employment generator               | 50%   | 40%              | 10%                  |
| Contributor to industrial capacity | 50%   | 40%              | 10%                  |
| Technical/technological capability | 50%   | 40%              | 10%                  |
| Support of depressed regions       | 30%   | 60%              | 10%                  |
| Strategic industry                 | 40%   | 40%              | 20%                  |
| Vehicle to attract investment      | 30%   | 40%              | 30%                  |
| Public sector policy delivery      | 10%   | 50%              | 40%                  |
| Profit/taxation potential          | 0%  | 60%              | 40%                  |

68. The first thing to note is that in no case did less than 60% of respondents consider shipbuilding as being important or very important in respect of the economic perspectives shown, and whichever way one wishes to read this table the inescapable conclusion is that responding governments consider shipbuilding as an important economic activity.

69. However, within this broad conclusion, there are some interesting differences between the individual items shown in Table 1. First, shipbuilding as an employment generator, contributor to industrial capacity and its technical/technological capability were ranked as the most important, with 90% of respondents believing these to be important or very important. As discussed in earlier sections of this paper this is understandable, as shipbuilding can contribute significantly in these ways, and can continue to do even if fully privatised, so that economies and governments can benefit in this way without necessarily drawing the public funds.

70. On the other hand, shipbuilding as a vehicle to attract investment, to deliver public policy and for its profit/taxation potential received considerably less support.

71. Recalling that the majority of respondents were from the OECD, it is perhaps not surprising that shipbuilding is not seen as a strong vehicle to attract investment, principally because there are few opportunities to expand the industry in OECD member countries, and most investment is directed in the acquisition and establishment of facilities in emerging economies. This is one area where views could be expected to be different if the questionnaire were to be completed by economies outside the OECD that are recipients of FDI.

72. Similarly, most OECD shipbuilding enterprises are now privately owned, and while it is possible to use shipbuilding to deliver public policies (such as employment generation, or establishment of facilities in depressed regions) even if those enterprises are privately owned, this would be much more difficult, and would almost certainly require the use of government incentives to achieve. In other economies where shipbuilding enterprises are still largely in public ownership, it could be expected that the level of importance attributed to shipbuilding for this purpose would be considerably higher.

73. Finally, it is interesting to note that while none of the respondents considered shipbuilding as very important for its profit/taxation potential, 60% still considered it important, which could be read (in a rather inverse way) that most governments expected the shipbuilding sector to operate profitably and not rely on its other contributions to a nation's economy to ensure survival even as loss-making enterprises.

## *Industry Perspectives*

74. The shipbuilding industry (both shipbuilding associations and individual companies) were given the opportunity to respond to a questionnaire covering various pressures and rationales for decisions taken in the industry that could affect its structure. A useful number of responses from industry (some from associations representing the views of their members) were received from both from OECD and non-OECD economies. Once again, the intent is not to produce a statistically valid analysis but to provide a useful indication of the views of industry on these issues. A copy of the industry questionnaire can be found in Annex III.

75. The first issue put to industry was to explore whether there were pressures for shipyards to consider mergers and acquisitions involving other domestic yards. This received a mixed response, with a majority agreeing that there was some pressure. An association response noted that while there was no specific pressure for domestic mergers and acquisitions, these were nevertheless of increasing relevance to shipyards for commercial reasons.

76. When asked to indicate the *relative importance of various types of pressures* experienced by the industry to consider local mergers and acquisitions, the rough order of importance was as follows:

- i.* Achieve economies of scale,
- ii.* Increase market share,
- iii.* Acquire skills and technology,
- iv.* Product diversification,
- v.* Entry into niche markets, and
- vi.* Government direction/encouragement.

77. An association also noted that other synergies such as purchasing and engineering capacity were also very important to its members.

78. As a general observation, the most important pressures identified by the industry are clearly commercially driven, and these targeted the reduction of costs, capturing a larger slice of the market and acquiring skills and technology. This was expected from a sector that over the years has largely shed public ownership.

79. Therefore, while it was not expected that government pressure would rate highly as a factor encouraging domestic mergers and acquisitions (and indeed overall it rated last), it was nevertheless significant that an association representing OECD shipbuilders (and carrying significant weight because of the number of yards it represents) indicated in its response that government direction and encouragement was an “important” factor for its members.

80. This response was intriguing, given that in response to their questionnaire virtually all OECD governments indicated that while shipbuilding as an important economic activity, they also generally claimed a very low level of involvement in the industry, and this slight disconnect may be another aspect that could be further tested in work leading up to the proposed Workshop in 2008.

81. The next part of the industry questionnaire dealt with the *rationales* that have been driving the *rapidly growing number of investments* made by shipyards (mostly, but not exclusively, from OECD economies) *into foreign yards*.

82. Conceptually, the growing desire of economies (both developed and emerging) to attract FDI, and the growing flexibility of governments to allow direct investment in their industry sectors, could be expected to create a “pull-push” effect on shipbuilding investments. The “pull” would occur through governments actively bidding to attract investments by making their economies attractive for investors. This could entail general policies such as effective ownership laws and legal regimes, the facilitation of profit repatriations and the provision of suitable infrastructure, through to very specific incentives such as preferential land/infrastructure access, special tax breaks and even financial contributions.

83. On the other hand, the “push” would come from the desire of shipbuilding companies to relocate or expand outside their national borders to take advantage of lower costs of inputs and other factors that would make their enterprises more competitive. One of the questions in the questionnaire was intended to test the relevance of these different factors.

84. The indicative results from the industry responses show that the most important factors are of the “push” variety, and almost unanimously the responses gave very little weight to the “pull” exerted by government support and incentives. The results, in rough order of importance, were as follows:

- i.* Low production costs,
- ii.* Better access to key markets,
- iii.* Availability of land infrastructure,
- iv.* Technology/construction techniques,
- v.* Outsourcing of hulls, components etc,
- vi.* Skilled labour forces,
- vii.* Underutilised shipbuilding yards,
- viii.* Attracted by government support.

85. The striking thing about this list is the very low importance attributed to government support, especially many governments have made shipbuilding a key pillar of economic growth, and have set out to encourage and attract FDI destined for the shipbuilding sector. In addition, there are frequent reports of governments enticing foreign shipbuilding companies by facilitating their investment, and on occasions reports filter through of virtual bidding exercises to attract interested companies<sup>8</sup>.

86. One explanation of this unexpected outcome could be that respondents focused on the more immediate business environments that formed the basis of their decisions, rather than how those effects came about. For example, preferential land costs and special taxation packages could have been bundled by the respondents into “low prod production costs” as the reason for the foreign investment, rather than the government policy that provided them. In that case, it probably reflects that the wrong question was asked, or the right question asked in the wrong way. In that is the case, then the incidence and success of government support and encouragement to attract foreign investment is another issue that could usefully be examined in the December 2008 Workshop.

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<sup>8</sup> While a search revealed numerous examples, only one is shown here; a report in Lloyd’s List on 30/10/06 “*March date for HHI ship debut in Philippines*”, which reported that Hanjin Heavy Industries (Korea) would be investing USD1 billion into building a mega-yard in Subic Bay. The press report noted that “The Philippines government, keen to place many of its unemployed in meaningful employment, is leasing the space for a mere \$176 000 a year, and there have been some nice tax breaks thrown in for good measure”.

87. The questionnaire then asked industry for its views of the *preferred forms of cross-border participation* when these took place. The order of preference of the various option offered was as follows:

- i.* Outsourcing,
- ii.* Technology transfers,
- iii.* Strategic alliances,
- iv.* Investment,
- v.* Acquisitions,
- vi.* Joint ventures,
- vii.* Provision of plant and equipment,
- viii.* Mergers.

88. The majority of reports on foreign investments that appear in the press refer to mergers and acquisitions, but it is interesting to see that from the industry's perspective other, less direct forms of cross-border participation appear to be more important. Indeed, the four most preferred forms are what could be termed as "doing business" activities; that is, normal commercial practices aimed at enhancing efficiency and lowering costs through the involvement of outside agents.

89. For example, outsourcing and technology transfers frequently go together, where a shipbuilding company contracts components (up to and including entire hulls) from an outside yard and then transfers technology to that company to bring its products up to standard. Similarly, technology transfers are frequently pre-requisites for investments or joint ventures by foreign yards.

90. Also of interest is that while acquisitions are ranked relatively highly, mergers are at the bottom of the list (and in the questionnaires were last by a significant margin). This is not entirely surprising, as mergers would imply a certain degree of synergy and commonality of standards and business practices between the merging entities that may not always be present in cross-border mergers. Following on from this, the higher ranking given to acquisitions no doubt reflect the desire of the investing party for the greater degree of control that can be exercised by the acquiring company on the operations of its new subsidiary.

91. The other issue to consider is that investing or participating companies do not always have perfect freedom to exercise their preferred mode of cross-border participation; for example, many governments allow only foreign participation into joint ventures, often with associated technology transfers, with their domestic shipbuilding entities.

92. The examination of the availability, and inherent benefits/difficulties, with various forms of cross-border participation may also be a useful issue for further consideration in the December 2008 Workshop.

## **CONCLUSIONS**

93. This brief paper has examined the factors that could be expected to shape the structure of the world's shipbuilding industry. The first major structural change has been the transition of shipbuilding industries from largely public ownership to largely private ownership. That transition is virtually complete in the developed economies, but is only just starting in many developing and emerging economies. This change has been occurring for many years, and is only briefly dealt with in this paper.

94. The second major structural change has been the increasing level of foreign participation in an industry that for many decades had been under virtually total domestic control. This is a development that is relatively recent, and the paper examines, both conceptually and through some empirical evidence, what factors have been driving this structural change, and which factors are considered to be most important by governments and industry.

95. The paper postulates that conceptually it could be expected that the industry would be considered to be important by governments because of the importance of the sector to the economy, and its ability to achieve important public policy objects (such as employment generation or as a major contributor to national industrial capacity), in this proved to be the case with responses from governments.

96. However, responding governments did not rate the industry highly as a vehicle to attract investment, which is to some degree counter-intuitive, and the response was probably affected by the very small representation on non-OECD economies.

97. From an industry perspective the very low importance attributed to government support/incentives as a reason for undertaking foreign investments seemed to be at odds with the many reports of governments "bidding" for FDI from foreign enterprises into their shipbuilding sectors, but this could be attributed to the wrong question being asked, and this issue could benefit from further analysis.

98. Despite this, the industry responses reaffirmed the intuitive view that most emphasis when decisions are made to invest in foreign yards was placed on lowering production costs, the availability of suitable land and infrastructure, and the desire to have access to key markets.

## ANNEX I

### INDICATIVE LIST OF FOREIGN INVESTMENTS REPORTED IN A THREE MONTH PERIOD IN THE PRESS<sup>9</sup>

| Host Economy                        | Investing Economy                          | Activity   | Source                        |
|-------------------------------------|--|--|-------------------------------|
| Finland (Turku Ship Repair)         | Estonia (BLRT Group)                       | Acquisition  | Sea News 9/6/07               |
| Lithuania (Western Shipyard)        | Norway (Fikerstrand Verft)                 | Joint venture  | Tradewinds 15/6/07            |
| China (Yantai)                      | South Korea (Daewoo Heavy Industries - HI) | 49% ownership of joint venture in Shandong Province        | Tradewinds 22/6/07            |
| China (Cosco)                       | Japan (Kawasaki HI)                        | Proposed 30% ownership of development in Dalian Province   | Lloyd's List 19/6/07          |
| China (Ningbo)                      | South Korea (Samsung HI)                   | Construction of new yards                                  | Tradewinds 22/6/07            |
| China (Hentai)                      | South Korea (Daewoo HI)                    | Hull block facility  | Tradewinds 22/6/07            |
| Philippines                         | South Korea (Hanjin HI)                    | Greenfield development in Subic Bay                        | Lloyd's List 22/6/07          |
| North Korea                         | South Korea                                | Possible joint venture                                     | Sea-Trade Asia Online 22/6/07 |
| Pakistan                            | South Korea (Daewoo HI)                    | Proposed collaboration, greenfield development Gwador Port | Sea-Trade Asia Online 22/6/07 |
| India                               | Japan (Mitsubishi HI)                      | Proposed joint venture to manufacture marine turbines      | Wall Street Journal 5/7/07    |
| China                               | USA (JP Morgan - Goldman Sachs)            | Proposed major stake in new company                        | Tradewinds 6/7/07             |
| Philippines                         | South Korea (Hanjin HI)                    | Fully owned greenfield development                         | Tradewinds 13/7/07            |
| Philippines                         | Japan (Tsunishi Shipbuilding)              | Subsidiary   | Tradewinds 13/7/07            |
| China (Zhousan Vessel Construction) | Japan (Tsunishi Shipbuilding)              | Subsidiary   | Tradewinds 13/7/07            |
| Singapore (Pan United Shipyard)     | Dubai (Dubay Drydocks)                     | Takeover   | Tradewinds 13/07/07           |

<sup>9</sup> This list is indicative only, and is not an exhaustive record of press items relating to this subject. Some items listed may have been completed some time ago, while others are proposals only.

|                                     |   |   |                                  |
|-------------------------------------|---|---|----------------------------------|
| France (Alstom Marine)              | Norway (Aker Yards)                         | Subsidiary (already completed)                              | Lloyd's List 12/7/07             |
| Vietnam (Vinalines Marine)          | Hong Kong (Sam Woo Holdings)                | Joint venture on new shipyard                               | Lloyd's List 16/7/07             |
| China                               | South Korea (Samsung HI)                    | Direct investment   | Tradewinds 20/7/07               |
| France (Aker Solutions)             | Norway (Aker Yards)                         | Full subsidiary in design facility                          | Lloyd's List 17/7/07             |
| India (Pipevan Shipyards)           | Various                                     | Proposed 40% foreign equity                                 | Lloyd's List 26/7/07             |
| Indonesia (DKB Shipbuilding)        | South Korea (C&Heavy Industries)            | Joint venture   | Tradewinds 3/8/07                |
| Germany                             | Finland (Wärtsilä)                          | Acquisition of design facility                              | Lloyd's List 16/8/07             |
| China                               | South Korea (STX Corp)                      | Joint venture   | Lloyd's List 13/8/07             |
| India (Shipping Corporation, India) | Unspecified                                 | Proposed foreign participation in joint venture             | Tradewinds 24/8/07               |
| China                               | Singapore (Raffles Shipping Gp)             | Joint venture in Shandong Province                          | Lloyd's List 29/8/07             |
| China                               | Chinese Taipei                              | Joint venture in Quanzhou Province                          | Lloyd's List 31/8/07             |
| China                               | Private listing on Hong Kong Stock Exchange | China State Shipbuilding Corporation Ltd                    | Tradewinds 30/8/07               |
| Lithuania                           | Denmark (Moller-Maersk)                     | Reference to acquisition of Baltja Shipyard in 1997         | Tradewinds 30/8/07               |
| China (Yangzijiang Shipbuilding)    | Private investment                          | Mentioned as China's first privately listed shipyard        | Business Times Singapore 1/09/07 |
| China                               | Hong Kong (Titan Petrochemical)             | Acquisition of facilities                                   | Lloyd's List 4/9/07              |
| Philippines                         | South Korea (Hanjin HI)                     | Subsidiary company  | Lloyd's List 6/9/07              |
| Philippines (Aboitz Group)          | Japan (Tsunishi HI)                         | Joint venture creating Tsuneshi heavy Industries (Cebu) Inc | Lloyd's List 6/9/07              |
| Poland                              | Ukraine                                     | Investment in Gdansk shipyards                              | The News 6/9/07                  |
| Pakistan                            | Not decided                                 | Anticipated joint venture to establish new yards            | Lloyd's List 11/9/07             |
| India                               | Finland (Wärtsilä)                          | Investment in propeller manufacturer                        | Lloyd's List 13/9/07             |
| South Korea                         | Finland (Wärtsilä)                          | 50:50 joint venture to manufacture engines)                 | Lloyd's List 13/9/07             |

## ANNEX II

### CHANGING STRUCTURE OF THE WORLD SHIPBUILDING INDUSTRY

#### *Output Description for this project from 2007/08 Programme of Work*

“World shipbuilding is a global industry, with ship buyers generally being able to place their orders at any shipyard, and in recent years there has also been a growing integration of operations, with cross-border co-operative arrangements, investments, mergers and takeovers<sup>10</sup>. The report on industry structure would examine these developments and provide an analysis of the different structural arrangements in the industry and their likely impacts.”

#### *Project Outline*

The output description shown above provides the general approach to the study. This is not intended to be detailed examination of the existing industry structure, but an analysis of:

- how shipbuilding is perceived by governments as a contributor to the national economy;
- whether or not the shipbuilding sector is considered to be a “national” industry, or whether foreign participations/investment is permitted (and under what conditions);
- the present role of governments (if any) to guide developments in the sector;
- reasons for the increasing globalisation of the industry (through foreign participation); and
- ways in which this globalisation is achieved (and thus changing the structure of the industry).

An examination of recent events (such as foreign investments, outsourcing and mergers and acquisitions) will provide a useful basis for the analysis of changes to the industry structure, but this would be further enhanced if it could also take into account current government policies that may affect that structure, as well as industry views on its objectives and expectations with respect to how business will be carried out in the future.

The report will be factual and analytical, and will not make any judgements regarding the suitability or appropriateness of any government or industry objective, and will be intended solely as an information document and policy tool.

It is hoped that some of this information will be collected through questionnaires sent to WP6 and other participating governments and peak industry associations. A questionnaire for governments is attached.

The questionnaire is not intended to be lengthy, and should not take too much time to complete, especially as a lot of the information can be provided by either sending copies of material or providing Internet references. However, please do not hesitate to add extra sheets for information if you so desire.

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<sup>10</sup>

For the purposes of this study, cross-border activities are taken in their broadest sense; for example the outsourcing of hulls to foreign yards would be considered a cross-border activity. The purpose of this broad-ranging approach is to help provide guidance on what future activities and initiatives may impact on the future structure of the industry.

## QUESTIONNAIRE FOR GOVERNMENTS

*ECONOMY* \_\_\_\_\_

### Question 1 (a):

| <i>How important is shipbuilding as an economic activity? (Please tick appropriate box)</i> |                       |                  |                      |
|---|-----------------------|------------------|----------------------|
| <i>Item</i>   | <i>Very important</i> | <i>Important</i> | <i>Not important</i> |
| Strategic industry  |                       |                  |                      |
| Employment Generator  |                       |                  |                      |
| Support of depressed regions  |                       |                  |                      |
| Contributor to industrial capacity  |                       |                  |                      |
| Technical/technological capability  |                       |                  |                      |
| Vehicle to attract investment   |                       |                  |                      |
| Public sector policy delivery   |                       |                  |                      |
| Profit/taxation potential   |                       |                  |                      |

*Question 1(b): Are there any other ways in which the shipbuilding industry can be considered an important economic activity? Please specify.*

*Question 2: Does the government have any formal plan or policy intended to set objectives for the shipbuilding industry? If it does could this be attached, or an Internet reference provided?*

*Question 3: Is the shipbuilding industry considered to be “national” or is it open to foreign participation and/or investment? If it is open, are there restrictions to that participation (eg., only joint ventures, technology transfers etc)? Please specify.*

*Question 4: Does government retain control and/or ownership of any shipbuilding companies/facilities? If it does, is this for public policy purposes or for other reasons? Are there plans or a timetable for the government to divest itself of that participation?*

*Question 5: Are there other documents that outline the government’s approach to the shipbuilding industry? Can these be provided or appropriate internet references given?*

## QUESTIONNAIRE FOR INDUSTRY

**Question 1(a):** *Is there pressure on shipyards to consider mergers and acquisitions with other domestic yards?*

**Question 1(b):** *If the answer is yes, please indicate the relative importance of the various factors shown below:*

| <b>Factor</b>                      | <b>Very Important</b> | <b>Important</b> | <b>Not Important</b> |
|------------------------------------|-----------------------|------------------|----------------------|
| Government direction/encouragement |                       |                  |                      |
| Achieve economies of scale         |                       |                  |                      |
| Acquire skills/technology          |                       |                  |                      |
| Product diversification            |                       |                  |                      |
| Entry into niche markets           |                       |                  |                      |
| Increase market share              |                       |                  |                      |
| Other (please specify)             |                       |                  |                      |

**Question 2:** *In recent years there has been an increasing trend of investment and participation in foreign yards. Given the situation today, is such participation or investment easier, more difficult or about the same as (say) five years ago?*

**Question 3:** *What are the principal rationales driving these participations and investments?*

| <b>Rationale</b>   | <b>Very Important</b> | <b>Important</b> | <b>Not Important</b> |
|--|-----------------------|------------------|----------------------|
| Low production costs   |                       |                  |                      |
| Skilled labour forces  |                       |                  |                      |
| Technology/construction techniques                                   |                       |                  |                      |
| Underutilised shipbuilding yards                                     |                       |                  |                      |
| Availability of land and infrastructure                              |                       |                  |                      |
| Outsourcing hulls, components etc                                    |                       |                  |                      |
| Better access to key markets   |                       |                  |                      |
| Attracted by government support (eg., regional development, R&D etc) |                       |                  |                      |
| Other (please specify)   |                       |                  |                      |

**Question 4:** *What are the preferred forms of cross-border participation?*

| <b>Form of participation</b> | <b>Very Important</b> | <b>Important</b> | <b>Not Important</b> |
|------------------------------|-----------------------|------------------|----------------------|
| Outsourcing                  |                       |                  |                      |
| Investment                   |                       |                  |                      |
| Technology transfers         |                       |                  |                      |
| Provision plant & equipment  |                       |                  |                      |
| Strategic alliances          |                       |                  |                      |
| Joint ventures               |                       |                  |                      |
| Mergers                      |                       |                  |                      |
| Acquisitions                 |                       |                  |                      |
| Other (please specify)       |                       |                  |                      |