

**COUNCIL  
WORKING PARTY ON SHIPBUILDING**

**SHORT SUMMARY OF RECENT WORK BY THE WP6 ON THE MEASUREMENT OF CAPACITY  
IN THE SHIPBUILDING INDUSTRY**

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*This document is submitted for information and discussion to delegates at the WP6 meeting on 25 November 2014.*

Contact: Structural Policy Division, Mr. Laurent Daniel, Tel.: +33 (0)1 45 24 18 69;  
Fax: +33 (0)1 44 30 62 63; E-mail: laurentc.daniel@oecd.org

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## SHORT SUMMARY OF RECENT WORK BY THE WP6 ON THE MEASUREMENT OF CAPACITY IN THE SHIPBUILDING INDUSTRY

### 1. Introduction

1. The WP6 Programme of Work and Budget (PWB) for 2015-2016 includes a work item on demand and supply in the shipbuilding industry. The study to be conducted in the next two years will analyse expected demand and existing and expected supply in different segments of the shipbuilding industry. This work on supply and demand in the shipbuilding industry aims at increasing transparency in the market, in particular as it is expected to provide a better understanding of the magnitude and the sources of overcapacity. This will improve our understanding of possible future pressures for the introduction of policies which lead to market distortions, as excess capacity is generally associated with increased pressure on governments to support the industry. This study will also consider capacity and structural adjustment issues.

2. This work on excess capacity in the shipbuilding industry will build on the experience in other parts of the OECD that have analysed sectors also facing problems of overcapacity, including the steel industry, the energy sector, the automotive industry and fisheries. The work on shipbuilding and the offshore industry and, in particular the discussions at the 24 November 2014 workshop on this topic, could also be relevant for the assessment of the future excess capacity as the demand for offshore activities could help to absorb some shipbuilding excess capacity in the future.

3. The consulting firm Spence and Young Consulting (SSY) presented an analytical report [[C/WP6\(2014\)9](#)] (OECD, 2014) on supply and demand in the shipbuilding industry at the 12-13 June 2014 WP6 meeting. It showed that global shipbuilding capacity had expanded considerably since the early 2000s, driven by capacity expansion in China. The fall in new orders after 2008 led to a reduction of capacity utilization. SSY projections suggest that existing capacity will be sufficient for the next decade or more.

4. Excess capacity is a major issue for the shipbuilding industry, but assessment of its magnitude is complicated since the measurement of capacity in and of itself is very difficult. The report by SSY emphasised that capacity is demand-sensitive and can alter significantly at short notice, underlining why it is difficult to measure global capacity correctly. The Secretariat has considered that a discussion at the 25 November 2014 WP6 meeting on the measurement of capacity would help to prepare the work on capacity to be conducted during the next biennium.

5. Section 2 presents a short summary of the past assessments by the WP6 on issues of capacity and excess capacity. Given the resource constraints of the Secretariat and the burdens of data collection on members, the use of existing statistical data appears to be a more realistic approach than conducting regular surveys as done by the WP6 before 1999. The recent report on supply and demand in the shipbuilding industry (OECD, 2014) did not develop a specific methodology for measuring capacity in the shipbuilding industry, but used the methodology mentioned in the OECD discussion paper on shipbuilding capacity [[C/WP6\(2011\)13](#)] that was presented at the WP6 meeting on 24-25 November 2011 and that is referenced and updated in this paper (Section 3). Section 4 presents indicative issues for discussion regarding the measurement of capacity in the shipbuilding industry.

## 2. Past assessments of capacity by the WP6

6. The WP6 has a long experience in dealing with the measurement of shipbuilding capacity. Until 1999 the WP6 sent a yearly “Questionnaire on Shipyards for shipbuilding capacity evaluation” [C/WP6(99)7] to member governments and some participating non-OECD economies. These questionnaires led to capacity assessments. The last one was issued in 1999, eliciting data for 1998. However, the use of questionnaires was not considered to be reliable, as the geographical coverage was incomplete and there were some methodological weaknesses.

7. In 1999, the Secretariat initiated discussions with the key shipbuilding associations to elaborate a common methodology to estimate capacity; this methodology is presented in Annex 1. These meetings resulted in the formulation of a new process: the associations provided to their national governments detailed information on shipyard facilities and production data that was forwarded to the Secretariat. The Secretariat then produced capacity evaluations for the WP6 based on the agreed methodology. This new process was considered to be an improvement as compared to previous evaluations; however new technical problems appeared with this new methodology, notably in the measurement of the productivity factors. The last evaluation of shipbuilding capacity using this methodology was completed in 2004.

8. The discussion paper on shipbuilding capacity (OECD, 2011) presented two approaches to impute capacity in the absence of comprehensive sources of national capacity data. It recognised that this is an inferior approach to the previous ones, because “*at best it can only provide a **base-line** assessment of capacity (what the industry **can** produce), but not a measure of **potential capacity** (what the industry **could** produce), which in policy terms would be more useful*” (OECD, 2011). These approaches would allow providing a rough but easier assessment of demand/supply imbalances and would be potentially useful for policymakers.

## 3. Methodologies to estimate shipbuilding capacity

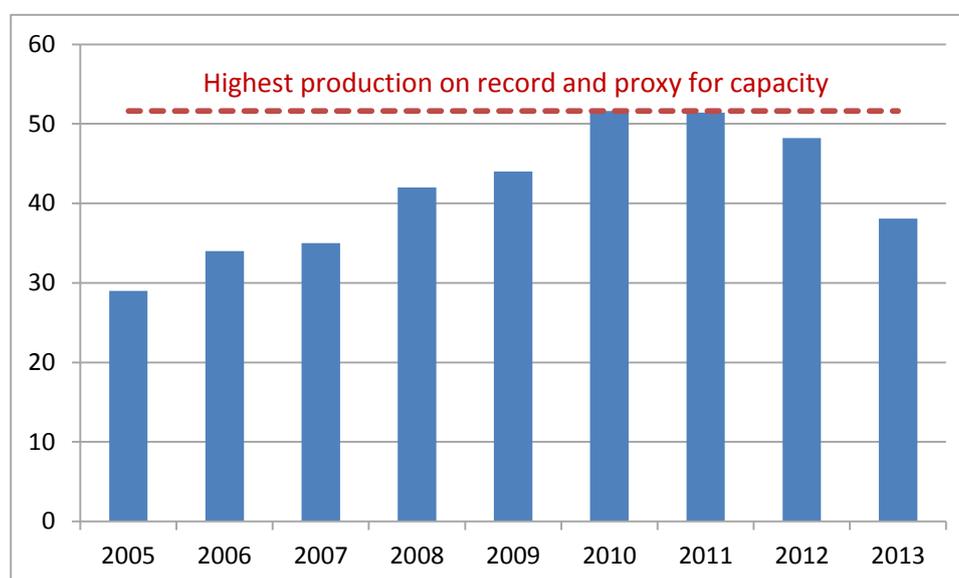
9. In the discussion paper on shipbuilding capacity (OECD, 2011), two methodologies to estimate shipbuilding capacity were presented. The first methodology is based on the highest shipbuilding output on record that could be used as an estimate of shipbuilding capacity, because, when demand is very high, almost all shipyards are trying to produce at their maximum capacity. This might be adjusted for new investment and depreciation, but would still be a rough measure. The second methodology is based on yard by yard measurement of capacity. All the yard production capacities are added to calculate an aggregated global shipbuilding capacity. The details, advantages and drawbacks of these approaches are presented below.

### *Methodology 1- Maximum production approach*

10. It can be reasonable to consider that, when demand for the building of new ships is very high, shipbuilding output is close to capacity as all shipyards are expected to respond to this high demand. According to IHS Fairplay, the highest yearly shipbuilding output was recorded in 2010 (see Figure 1) and amounted to 51.9 million compensated gross tonnes (cgt). Following this maximum production approach, 51.9 million cgt could be imputed to represent current world shipbuilding capacity. The gap between actual production and this estimated capacity would then provide an estimation of excess capacity. With global ship completions amounting to 38.1 million cgt in 2013, excess capacity in the shipbuilding industry would then be 13.8 million cgt.

**Figure 1. Ship completions**

In compensated gross tonnes (cgt)



Source: IHS –Fairplay "World Shipbuilding Statistics" (Various editions).

11. The clear advantage of this approach is its simplicity. However, it involves a lot of weaknesses (OECD, 2011). Even in 2010, some shipyards were not working at full capacity, so this maximum production is not a fully reliable measure of capacity. Moreover, new facilities have been constructed and existing facilities have been upgraded after 2010, so capacity has continued to increase after this date. The shipbuilding capacity used to produce other equipment than ships, for instance off-shore facilities, is not taken into account in this methodology but could be converted back to the construction of ships and should have been included in the calculation. And finally, depreciation of the capital stock is not reflected in the estimate.

#### *Methodology 2 - Yard by yard measurement of capacity*

12. The Clarkson publication, "World Shipyard Monitor", provides a capacity assessment of 166 individual large shipyards. The capacity attributed to these shipyards is based on their maximum annual output since 2000. The aggregated shipbuilding capacity of these 166 shipyards amounted to 52.7 million cgt in October 2014 as compared to 48.1 million cgt in June 2011. Despite the fact that it does not take into account many shipyards, this estimate is higher than the 51.9 million cgt of the maximum production approach. However, this anomaly can be easily explained by the fact that shipbuilding capacity has increased since 2010.

13. Clarkson also provides the output of 254 other yards that amounted to 5.0 million cgt in 2013. Adding the most recent output of these 254 yards and the capacity of the 166 yards would allow improving the global estimate of capacity (OECD, 2011). This hybrid method leads to a global shipbuilding capacity of 57.7 million cgt in 2013. This methodology does not account for capacity that may have become obsolete since the year of maximum production. Moreover, this approach is based on only 420 yards, a figure far below the total number of shipyards in operation around the world.

#### **4. Issues for discussion regarding the measurement of capacity in the shipbuilding industry**

14. Several indicative issues for discussion regarding the measurement of capacity in the shipbuilding industry are presented below:

- Given the resource constraints of the Secretariat and the burdens of data collection on members, should we only rely on methodologies using public data sources?
- Should the two approaches to measure excess capacity be used, despite their drawbacks, to provide indicators of capacity and excess capacity in the shipbuilding industry?
- How can these approaches be improved to have a better and more detailed assessment of capacity in the shipbuilding industry?
  - Would an assessment of capacity by region/economy be a useful exercise to undertake?
  - Should we try to estimate shipbuilding capacity by vessel type?
- Are there other approaches to measure capacity and excess capacity in the shipbuilding industry that could be investigated?

## REFERENCES

OECD (1999), *Questionnaire on Shipyards for shipbuilding capacity evaluation* [[C/WP6\(99\)7](#)]

OECD (2011), *Shipbuilding capacity – Discussion paper* [[C/WP6\(2011\)13](#)]

OECD (2014), *Demand, Supply & Capacity in the global shipbuilding industry* [[C/WP6\(2014\)9](#)]

## ANNEX 1

### THE COMMON METHODOLOGY TO DERIVE SHIPBUILDING CAPACITY

#### I. Issues agreed in the first informal meeting on shipbuilding capacity on 20/21 April 1999

##### **Broad Philosophy**

There was agreement that the evaluation of future capacity should be undertaken by calculating shipbuilding capacity in a base capacity figure, and then modifying this by taking into account a number of future expected developments which would alter that capacity.

##### **Definition of Facilities**

It was further agreed that this analysis would be done on individual shipyard facilities, and that the broad intention would be to undertake detailed examination of the more important facilities, which the remaining smaller facilities would be estimated through statistical analysis.

For this purpose, the guideline to determine facilities that should be examined individually is that it should include those capable of producing vessels greater than:

- 100 metres in length, or
- 5 000 dwt, or
- 2 000 gt.

As general rule, all production capabilities which can be used for production of vessels without the need for additional inputs should be included in the analysis.

##### **Derivation of the Base Year Shipbuilding Capacity**

##### *Definition of Base Year Shipbuilding Capacity*

Base year shipbuilding Capacity is equivalent to current production, plus additional production which is feasible without any additional shipyard inputs (for example additional manpower, minor equipment or technological changes).

The method of calculating this Base Year Shipbuilding Capacity would be to:

1. Allocate an optimum product mix within the size of the shipbuilding facility. The optimum product mix should be based on the last five years production by the facilities<sup>1</sup>.

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<sup>1</sup> However, some recognition can be given to expected future developments which could radically alter that product mix.

2. Calculate the CGT tonnage.
3. Multiply the yearly turnover factor by the CGT tonnage of that allocation. The turnover factor should be based on, and be commensurate with, the above definition of Base Year Shipbuilding Capacity.

## **Evaluation of Future Shipbuilding Capacity**

### ***Definition of Future Shipbuilding Capacity***

Future Shipbuilding Capacity is the Base Year Shipbuilding Capacity as modified by the following factors:

- Changes to the turnover factor.
- New, expanded or deleted capacity.
- Facilities used for other activities, such as military vessels, off-shore structure or other construction activities which could be converted to merchant shipbuilding.

With regard to changes in the yearly turnover factor, this would be the result of workforce changes, technological improvements and minor equipment improvements (e.g. crane capacity), which would *inter alia* express themselves in reduced times in building docks, etc.

It was also agreed that while no special provision would be made for unused capacity (as this was to a large degree included in the definition of Base Year Shipbuilding Capacity), this would nevertheless be kept under observation.

## **II. Issues agreed in the second informal meeting on shipbuilding capacity on 28 May 1999**

### **1. Data for Evaluation**

Shipbuilder's associations proposed that the OECD Secretariat, on behalf of the Council Working Party, purchase *ship-by-ship construction data for last five years* from Lloyd's Maritime Information Service (LMIS), and provide this data to the three associations for shipbuilding capacity evaluation as supporting statistics to information provided by Governments.

### **2. Information on Shipbuilders**

The associations agreed that the accuracy and reliability of capacity evaluation would be maximised by taking into account as much information as possible. To this end, Governments should make every effort to collect information on a dock-by-dock basis in order to allow optimal evaluations to be made.

### **3. Unit**

The associations reaffirmed their earlier agreement that capacity evaluations would be undertaken on the bases of *cgt* (compensated gross tonnes), and not on *gt* (gross tonnes). They shared the view that this can contribute to minimise potential divergences when selecting reference ships and/or optimum product mix in the evaluation exercise.

However, the association also noted that in some case the current OECD cgt system potentially invites inconsistencies in derived figures. This should be addressed through a revision of the OECD cgt system, and in the first instance this is being examined by the associations.

#### **4. Turnover/Capacity**

The associations agreed, in order to make evaluations as practical as possible, turnover figures should be derived from shipyard data, and that the shipyards should be evaluated as follows:

- Group 1; Large shipyards which allow parallel construction: capacity would be evaluated by optimal product mix and turnover.
- Group 2: Other shipyards with an annual output of 10 000 cgt or more: capacity would be evaluated by a standard ship allocation method, or by optimal product mix and turnover.
- Group 3: Other shipyards with an annual output of less than 10 000 cgt: capacity would be evaluated by a statistical method.