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# THE LIQUEFIED PETROLEUM GAS SHIPPING MARKET IN 2004

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## Out of the doldrums to a sharp and sustained recovery

### Significant events

At the same time last year, we drew a comparison between the different shipping markets with the take-off of the oil and bulk sectors compared to the depressed state of the LPG sector over the recent years, marking a significant break in the respective evolution of these markets.

We also evoked the main readjustments, which were already taking place, susceptible of causing a reversal of this trend and bringing about a revival in this specialised shipping segment.

All these factors became more pronounced throughout the course of 2004 and gave rise as from May / June to a sharp jump in freight rates, for all sizes, both on the spot as well as on time charter market.

The main evolutions, of which some have been in evidence for several years, can be described as follows:

- ◆ Joint-ventures and pool agreements between owners and ship operators, leading to an optimisation of operations and a higher specialisation by groups of operators within the various categories of ship sizes and specific trade routes.
- ◆ The cross-purchases of ships, or even whole fleets, within the smaller sizes.
- ◆ A slow-down in newbuilding orders over the last few years, given the poor returns on investments in the gas shipping sector. Even if we have seen a correction during the last six months within the liquefied gas sector, shipyards' orderbooks are now sufficiently filled-up with orders of other ship types from sectors which have been riding high over the last two to three years (LNG, bulk carriers, and tankers). As of now, the lack slots availability

in the yards does not allow any further deliveries before end 2007 / beginning 2008, thus not before another three years!

- ◆ Demolition remained at the same limited pace as last year but with even higher values given the price of steel. The hurdle of \$ 400 per lightweight ton has been surpassed, putting the value of a 75,000 cbm VLGC of 25 years or more at nearly \$ 8 million apiece! Since the beginning of the year some 19 units have been sold for demolition for a total capacity of nearly half a million cbm.

- ◆ A sustained surge of imports to North America linked to the constant appreciation of natural gas prices, which have reached a level near to \$ 8 per mmbtu\* last November.

- ◆ An expansion in LPG and ammonia production and the long-awaited revival in petrochemicals, after the depression of the last few years, linked to an increase in deep-sea trade affecting voyage lengths and demand expressed in tonne-miles.

- ◆ A burst of imports into developing countries, such as China with its enormous population, making it susceptible to an impressive growth of such magnitude that it should spill over in the short and medium terms to a redistribution of major trades and economic movements in the world.

- ◆ A depreciation of the dollar against other currencies,

resulting in the necessity to give more dollars for the same front values.

Most of these trends have been building up over some time, but the year 2004 saw the confirmation of these expectations at such an accelerated rhythm that even the most astute forecasters have been confounded.

We shall not dwell in detail on the reasons for such a market correction, largely anticipated, but rather on the extent of this new situation and the consequences that might develop from such a change in situation.



In line with the freight market, which saw a steady rise, but more pronounced as from the third quarter, product prices also underwent a very strong appreciation right throughout the year. This increase gathered pace particularly in the second half, with highly volatile variations which allowed arbitrage movements between East and West. The threshold of \$ 500/t was crossed at the end of the year for LPG C&F sales into the Far East!

Our annual table showing the evolution of price levels for the main oil and gas related products over the last three years shows:

Products	Nov 2002	Nov 2003	Nov 2004	%
Crude oil, Middle East Gulf (\$/bbl)	24	28	35.5	+ 27 %
Brent crude, North Sea (\$/bbl)	24	29.5	45.2	+ 53 %
Naphtha CIF Rotterdam (\$/mt)	235	285	365	+ 28 %
Natural gas (\$/mmbtu US Henry Hub)	4.25 (Dec.)	6.75 (Dec.)	7.80 (Dec.)	+ 15 %
Propane CP (contr. price FOB Saudi Arabia) (\$/mt)	327	280	463	+ 65 %
Butane CP (contr. price FOB Saudi Arabia) (\$/mt)	327	280	473	+ 69 %
Anhydrous ammonia (FOB Black Sea) (\$/mt)	127	240	270	+ 13 %
Ethylene (contr. price Europe) (€/mt)	400	512	700	+ 37 %
Propylene poly gr (contr. price Europe) (€/mt)	470	425	620	+ 46 %
Butadiene (Europe spot) (€/mt)	520	490	627	+ 28 %
VCM (CIF Korea/Taiwan) (\$/mt)	460	590	800	+ 36 %

Shipping and freight levels in all sizes saw a marked increase as from the middle of the year and especially towards the end of the year.

We would point out that these average freight rates (in time charter equivalent of spot voyages) exclude any eventual ship's idle time (awaiting

Ships by size/category (cbm)	Nov 2002	Nov 2003	Nov 2004	%
VLGC 75/85,000 cbm spot MEG/Far East (\$/mt)	28	30	42	+ 40 %
VLGC 75/85,000 cbm 3-6 months t/c (\$/mth)	600,000	650,000	1,050,000	+ 62 %
LGC 52/59,000 cbm 2-6 months t/c (\$/mth)	575,000	650,000	800,000	+ 23 %
Mid-size 24/35,000 cbm equiv. t/c of spot voyage (\$/mth)	575,000	575,000	775,000	+ 35 %
12/22,000 cbm equiv. t/c of spot voyage (\$/mth)	405,000	425,000	650,000	+ 53 %
6/11,000 cbm ethyl. equiv. t/c of spot voyage (\$/mth)	300,000	340,000	575,000	+ 69 %
4/8,000 cbm semi ref. 2-3 months t/c or equiv spot	225,000	240,000	425,000	+ 77 %
4/8,000 cbm pressurised 2-3 months t/c or equiv. Spot	185,000	180,000	325,000	+ 81 %

\* Million British thermal units



**Gaschem Baltic**  
8,600 cbm, built in 2004  
by Severnav,  
operated by Gaschem

employment between voyages) and are neither representative of net profit for owners operating their ships on the spot market, nor of the long term transactions (two years or more).

## Situation by vessel size

### **VLGC (Very Large Gas Carriers) from 70,000 to 80,000 cbm**

A strong variation in spot freight rates characterised the first half of the year, leading to tighter and more stable levels in the second half.

Starting around \$ 30/t on the Middle East / Japan route at the beginning of the year, rates went over \$ 40/t and then approached \$ 48/t in October, with a critical peak period between June and September. A slight easing was felt as from November, but the level remained slightly above \$ 40/t at the end of December. These spot rates represent equivalent monthly time charter rates between \$ 700,000 and \$ 1,200,000 with a year average of about \$ 850,000.

The firmness of the naphtha market was again a determining factor throughout the whole year, with the returns on naphtha voyages substantially surpassing those of an LPG equivalent, thus providing 6 to 10 VLGCs being employed in this market.

Four units from the 1970's were scrapped at twice the price levels of the preceding year, thanks to steel prices remaining high.

13 new orders were registered during the year for delivery between end 2006 and 2008 at prices over \$ 70 million for the latter orders.

The entry of AP Moller into this sector was signalled with their order of four 82,000 cbm in Korea for delivery in 2007 and their subsequent commitment for a three-year charter of the VLGC 'Oriental Queen' -82,000 cbm- delivered to Unique Shipping in September 2004.

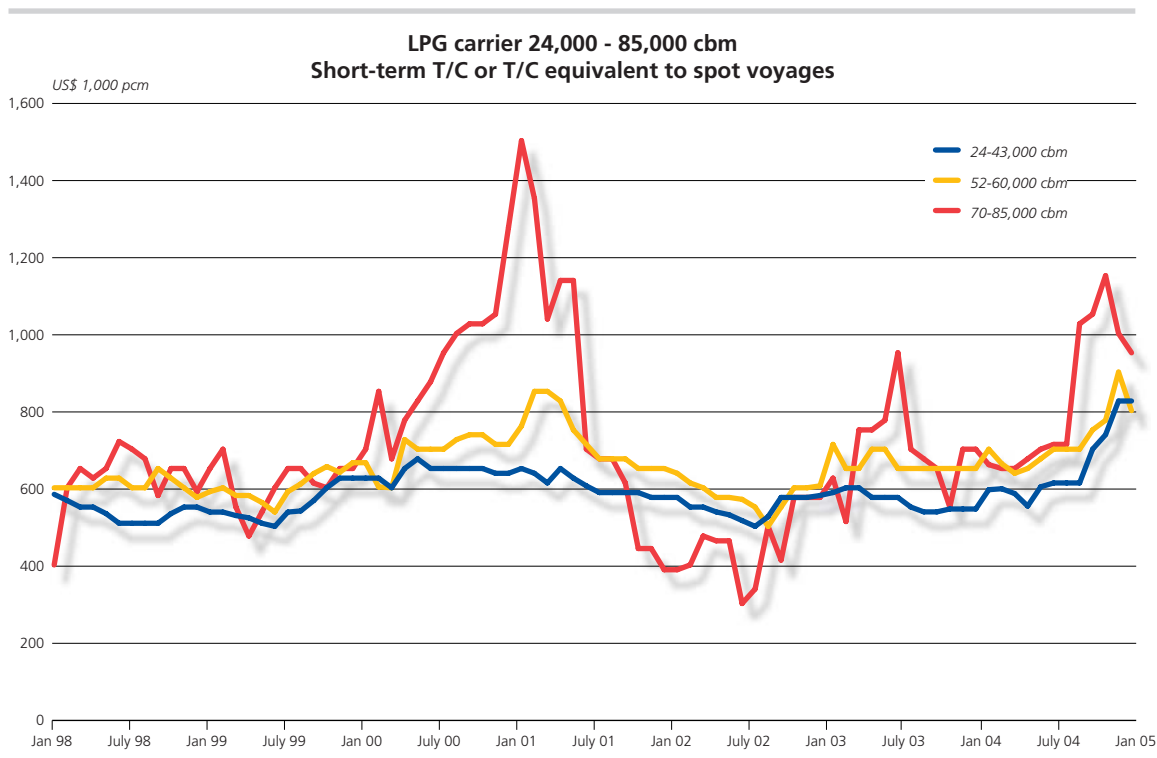
Market prospects in this size category remain positive for several years to come, but we cannot avoid to signal the risk of seeing again an imbalance, if the pace of new orders were to intensify or even to remain steady at the same rate as the last few months.

The big jump in newbuilding costs and the late delivery dates might however limit such a development or at least give rise to some reconsideration of market assessments.

### **LGC (Large Gas Carriers) from 52,000 to 60,000 cbm**

This segment size which had already fared well last year, improved strongly throughout 2004 to reach occasionally monthly time charter rates of nearly one million dollars on some voyages, with the average being around \$ 800,000 per month.

These units, mainly employed on the major ammonia and LPG trade movements, benefited from the strong revival of exports of these two products to



North America: ammonia due to the steady and sharp rise in the price of natural gas, from which it is derived, with a consequent drop in local production; and butane / propane due to the arbitrage which the price fluctuations within Europe, the Middle East and the US allowed.

Four newbuildings of 59,000 cbm were delivered respectively for Sonatrach, Solvang, and Yara, whilst two more are due to be delivered to Sonatrach and Yara in the course of 2005.

Bergesen sold two 53,000 cbm units, built in 1973 and 1979, for demolition.

Whereas the delivery of 10 newbuildings spread out between 2003 and 2005 might have led one to expect an occasional marginal overcapacity, it seems that the scrapping of the older units combined with the recent recovery of the market has allowed for a good balance, and even a slight improvement in the demand for these ships. All of this was supported by the firmness in the VLGC market and the contribution from the naphtha market.

#### **Midsize carriers 23,000 to 43,000 cbm**

A good vintage for this category of vessel confirming earlier expectations, with a steady progress and satisfactory results for owners.

It is nonetheless worth underlining that the consequences of the market's recovery as from the sum-

mer was less obvious in this size segment than in the others. A particularity we can attribute to the fact that this category had already registered far better results comparatively to the others since several years.

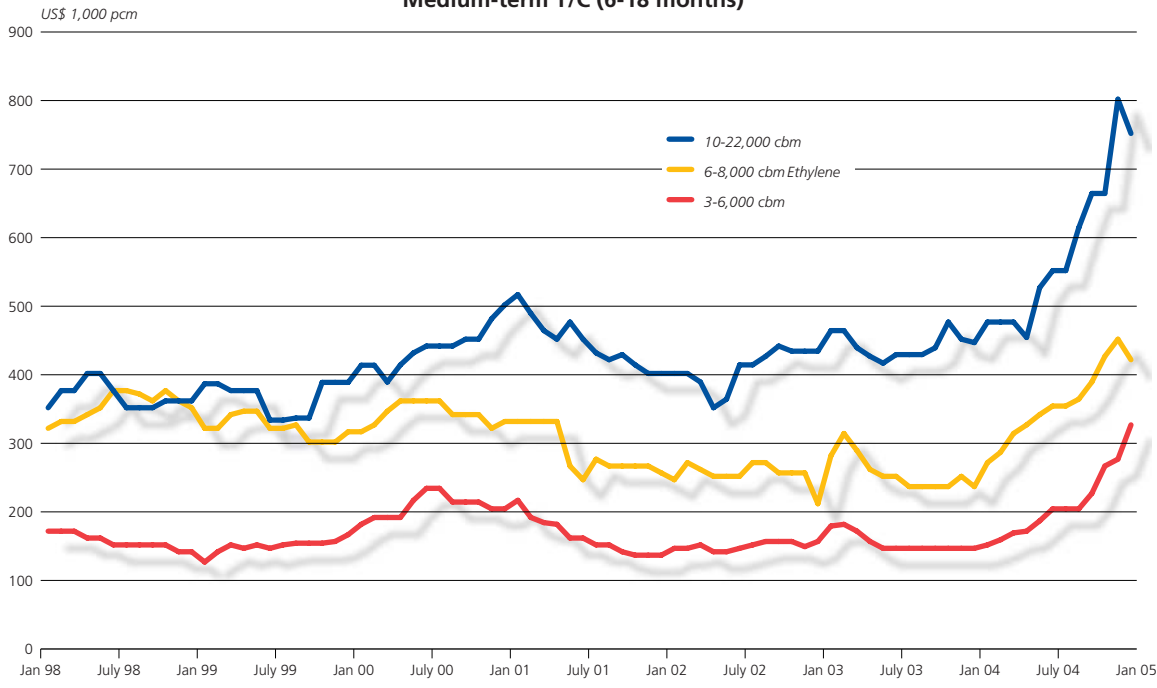
From a level of around \$ 575,000 in November 2003, the monthly time charter rate (equivalent t/c for spot voyages or short period t/c) for 24,000 to 35,000 cbm ships averaged at around \$ 775,000 in 2004.

The main ammonia trade routes are highly demanding this type of ship with a solid growth in transatlantic movements, as well as the Black Sea and the Middle East Gulf to Indian Ocean and inter Asia.

With only 30 %, the share of LPG in this segment is declining. The average idle time due to non-employment in this sector is now below 6 % whereas it was still over 14 % in 2003.

Contrary to what we expected last year, the stability of the market during the last few years and increased production forecasts, have triggered a mini-explosion in new orders for ships with a 35,000 to 38,000 cbm capacity for delivery between 2006 and 2007 (for account of K Line, Zodiac, Iino, Unique/Itochu, Bakri, and Sovcomflot). These eleven orders came on top of five 38,500 cbm ships ordered since last year for delivery in 2005 and 2006, which makes a total

**LPG carrier 3,000 - 22,000 cbm  
Medium-term T/C (6-18 months)**



of 16 units coming into service between end 2005 and 2007.

It should be noted that the last 35,000 cbm ships were ordered at over \$ 50 million per unit, whereas the previous orders inked in 2003 were done at just over \$ 40 million, thus representing an increase of 20 %. One should however remember that the depreciation of the dollar since September 2003 has been of around 20 %, a detail which should not be ignored in analysing price rise or increase in freight rates.

**Semi-pressurised/refrigerated  
gas carriers 8,000 to 22,000 cbm**

Among all the size segments, this category has been the first to benefit from the market revival. The chemical gas sector, and more particularly ethylene and propylene, were the principal driving force of this recovery. There were a few promising indications at the end of 2003 which were confirmed and then helped transform and amplify this trend as from July.

Most ethylene carriers which previously were forced to find alternative employment in LPG returned to their normal trade where the deep sea voyages have multiplied, giving a substantial increase in demand expressed in tonne-miles.

We have seen a lively recovery in exports of ethylene and propylene out of the US into Europe and

Asia, an increase in movements from the Middle East to Asia and more arbitrage positions being taken out of Europe to Asia. Additional movements from Asia to Europe have been motivated by the pressure on product prices resulting from shutdowns of crackers, planned or not, within the different geographical areas.

All these simultaneous movements created a tremendous pressure on demand, causing spot freight rates to hit levels never seen before, with increases of up to 70 %.

- ◆ about \$ 300/t for propylene lots of 6,000 to 8,000 mt from the U.S. to Asia
- ◆ up to \$ 180/t for ethylene in 2,000 to 4,000 mt lots from the U.S. to Europe
- ◆ up to \$ 250/t for ethylene in 4,000 to 5,000 mt lots from S.E. Asia to Europe
- ◆ about \$ 350/t for butadiene in 3,000 to 4,000 mt lots from Europe to Asia.



**Jessie Maersk**  
35,559 cbm, built 1991  
by Hyundai H.I.,  
owned by A.P. Moller

**Hermann Schulte**  
 5,673 cbm, built in 1980  
 by Meyer Werft, operated  
 by Dorchester Marine



Most charters were renewed for 2005 at levels ranging from 30 to 50 %, depending on the size and trading route. Some owners or operators had to refuse taking on new contracts due to a lack of potential tonnage. A first for several years!

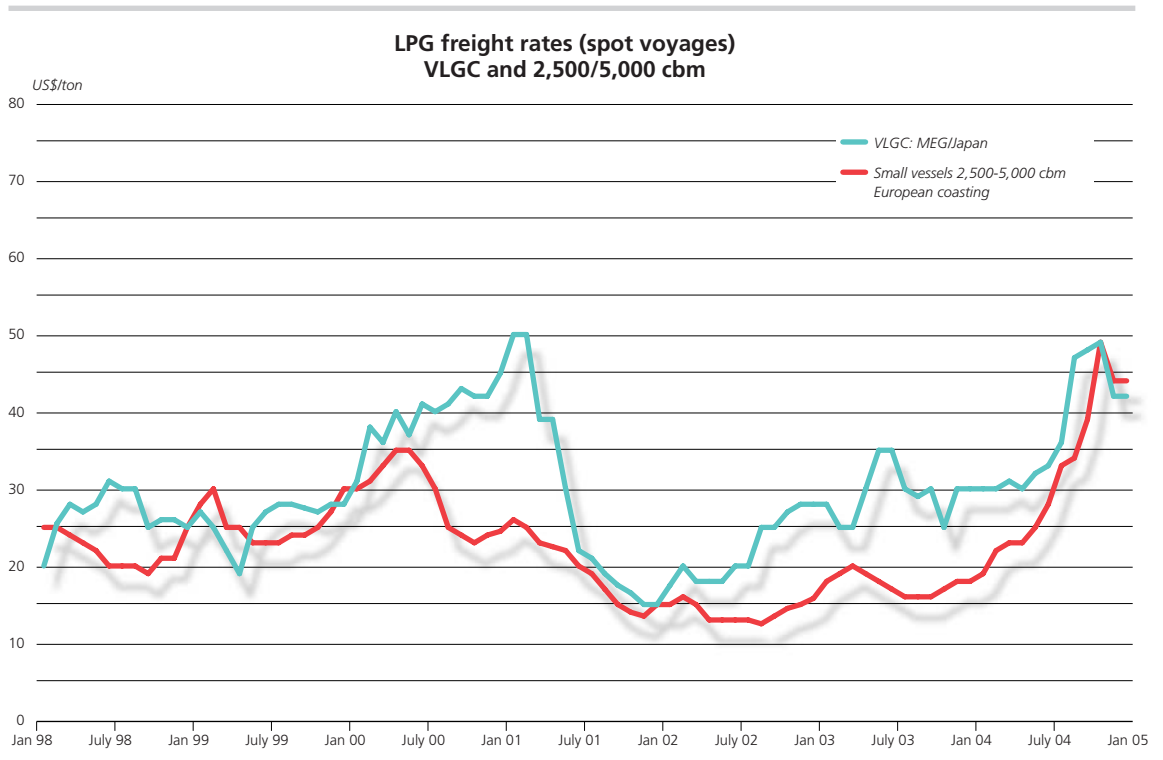
At the same time, the LPG activity was equally well supported by the arbitrage movements between Europe and the U.S. caused by the huge volatility of LPG prices in turn affected by the variations in oil prices.

Time charters were also greatly influenced by the market's recovery as from the middle of the summer and the majority of renewals for period busi-

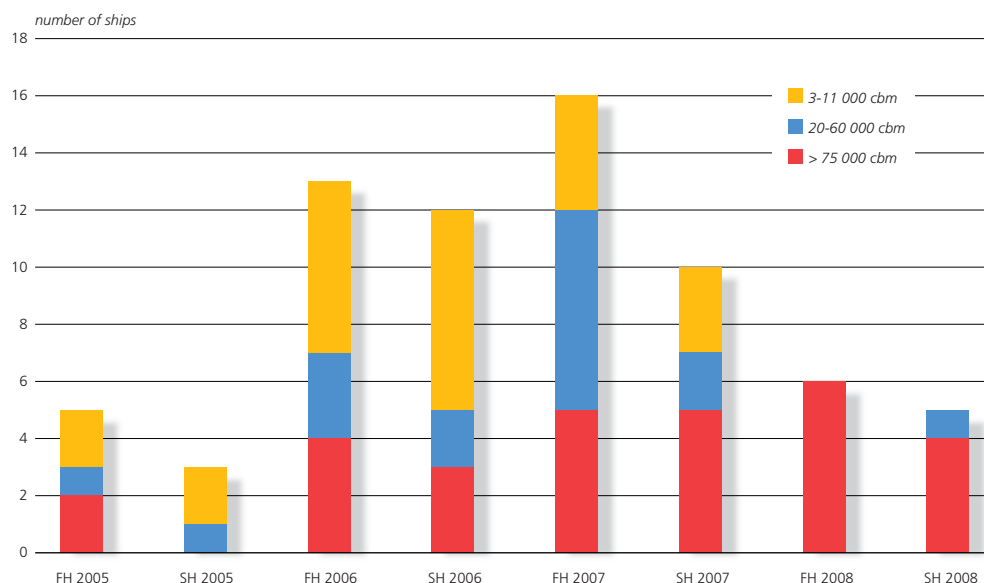
ness saw somewhat less pronounced increases ranging between 25 to 30 %.

On the newbuilding front, two orders of 22,000 cbm semi-ref were signed by Sonatrach / Hyproc with Namura for delivery in 2007 / 2008, two 16,000 cbm ethylene carriers were ordered by the Taiwanese Formosa Plastics with Jiangnan in China for delivery in 2006, whilst Lauritzen Kosan decided at the end of the year to order four 8,000 cbm ethylene carriers with INP in Korea for delivery in 2007.

A vessel of 15,000 cbm built in 1976 was sold for scrap at the beginning of 2004.



## LPG carriers deliveries shedule of ships on order - end 2004



In the same period, Sigloo (with a majority control by Camillo Eitzen) purchased seven 8,000 to 12,000 cbm ethylene carriers built in the 1980's, which Bergesen was looking to dispose of for quite some time, for a total value of around \$ 75 million.

Given the general optimism prevalent in the petrochemical sector (new productions, increase in consumption and demand in Asia) and the little addition of newbuildings tonnage over the next two to three years, the market for this size sector should remain very sustained in the coming years.

### Gas carriers of 8,000 cbm and less (pressurised and semi-pressurised)

Same causes, same results! Except that the market level for this size range was extremely weak over the previous two to three years, so that the recovery has been even more significant, compared to the other segment.

The increase in demand was felt right at the start of the year and then gradually developed during the first half. It was even more noticeable in the second half, both for semi-pressurised as well as pressurised ships.

A 3,500 cbm pressurised carrier was being traded at an equivalent time charter monthly rate of \$ 130,000 to \$ 140,000 at the beginning of the year, whereas the same vessel was trading at a level of \$ 250,000 to \$ 275,000 at the end of the year.

A 6,000 cbm semi-refrigerated vessel would fetch in the same periods a level of \$ 250,000 rising up

to nearly \$ 450,000 monthly t/c or equivalent spot rate, with an even more pronounced variation for ethylene carriers where a 6,000 cbm rose from \$ 275,000 up to \$ 550,000.

It should also be noted that there has been a correction in the traditional differentials between the levels of semi-refrigerated and pressurised carriers, with the latter catching up and nearly obtaining the same returns as the former. Another sign of the market's tendency!

As far as the time charter business is concerned, several contracts spanning up to 5 years, were principally undertaken by some owners-traders deciding to fix their position for the future.

A substantial rise in new orders, in particular for pressurised vessels between 3,500 and 9,000 cbm, was registered with Japanese shipyards for domestic owners-operators' account, placing these new units under long term contracts with Eastern and Western majors. We have counted currently some fifteen orders placed in 2004 for ships with a capacity between 3,500 and 9,000 cbm, of which two 8,600 cbm semi-refrigerated, for delivery between 2006 and 2008, as well as new orders which should be confirmed imminently for units of 4,000 to 9,000 cbm in Italy.

These past twelve months have also witnessed new merger transactions and fleet purchases between owners, which were anticipated for several years given the poor levels of past results...

During the second quarter, the Exmar Kosan pool took control of 12 pressurised carriers of 3,500 to 5,000 cbm from Far East Shipping, thus taking an additional grip on this inter Asian market. Several months later five 3,000 to 6,500 cbm semi-refrigerated carriers of Gibson Gas Tankers were acquired by Camillo Eitzen.

A Greek owner, Stealth Maritime, already well established in other types of ships, made a noteworthy entry into the gas sector with the acquisition of some ten small gas carriers of 3,000 to 5,000 cbm at prices well above those obtained last year.

## Prospects

Conditions for a very firm freight market seem to be in place for the next few years. Although it was already fairly clear, all the ingredients are now solidly anchored for the trend to pursue in the same direction.

Arrival of new tonnage over the next two years remains very limited and will probably not satisfy even a marginal growth in demand, whilst numerous factors tend to suggest that this is on an upward path, led by the ineluctable advance of energy demands from China and the developing countries. Even if this is likely to slow down one day, the tendency is still quite sustained.

Despite the high steel prices, which have allowed scrap values to double or even triple, owners will be tempted to extend the life of their ships in a market which pays well. But the new safety regulations and chartering practices of the Majors, are applying to more and more geographical areas and can no longer be much too "elastic". Units

which are over 30 years, or even 28 years, might hardly find employment and will probably be forced to retire in the coming years.

Recent orders for newbuildings have achieved prices which are some 20 to 30 % higher than in 2003 and the trend remains on the rise. Even taking into account the depreciation of the dollar, owners will have to find revenues allowing them to pay back their investment made at higher prices and over a shorter period.

Intra-Asia trade is to increase with the start up of new petrochemical production units at the end of 2005, thus absorbing a growing number of ships with a capacity of 4,000 to 8,000 cbm, which until now has been employed on deep-sea routes.

The horizon therefore seems fairly clear and relatively predictable for the two or three coming years, excepting a major crisis which would undermine all the fundamentals!

Taking long term shipping decisions has up to now often been limited by the important differential between spot freight market levels and the floor price below which an owner couldn't commit over a certain period of time.

The current improvement should allow this disparity to be corrected and favour longer term commitments by each contract party, be it charterer or owner, for a better control and appreciation of his shipping needs.

Let us hope however that the market players will remain reasonable and do not go into an over-investing circle with the risk of creating new imbalances. ■

## LPG second-hand market

### Ships over 50,000 cbm

Once again the second-hand market has not provided the opportunity to allow the rejuvenation of fleets or to invest into new ones, making owners who are looking to buy LPG carriers of less than 15 years to turn towards the newbuilding market, even if the prices proposed seem apparently higher and higher.

Only Bergesen, by means of a purchase option attached to long term charter, was able to acquire the 'Sunny Hope', 78,000 cbm, built in 1990, for about \$ 33 million.

Elsewhere we have registered prices close to those of scrapping, in the case of the sale of 'Yuyo', 83,000 cbm, built in 1979, or substantially more for the 'Gaz Concord' built in 1978.

While awaiting to take delivery of their newbuildings, Sonatrach has combined the sale of the 'Nemja', 56,000 cbm, built in 1983, at a reported price close to \$ 15 million, with a one year time charter of a much more modern carrier.

### **Ships between 20,000 and 50,000 cbm**

Indian buyers, such as Varun, have once more shown their ability to offer to Bergesen and Exmar attractive prices for carriers of less than 25 years, conditioning the sale to a period charter of at least two or three years back to the sellers' pool. The two oldest carriers, 'Hektor' and 'Hermion', 24,000 cbm, built in 1982 and 1984, were sold for about \$ 17 million each, whilst the 'Libin', 43,000 cbm built in 1982, was sold for about \$ 20 million.

### **Ships between 10,000 and 20,000 cbm**

At the start of the year, Geogas sold the 'Victoire', 17,500 cbm, built in 1990, for a price above \$ 20 million, while retaining control over the ship for the next 5 years. Thereafter, the sale by Exmar of her three ethylene carriers of 10,500 cbm, built at the end of the 1980s and beginning of the 1990s, for a price above \$ 40 million against a 5 year time charter, was the only one who livened up the sector.

### **Ships below 10,000 cbm**

It is in this sector that there has been the largest number of transactions this year. The rise in freight rates finally allowed sellers to find buyers for their fleets, and for buyers to be able to justify such investments thanks to the better economic environment.

The strong increase in newbuilding costs for this type of carrier also played its part in reactivating interest in second-hands, but for the moment buyers can only count on the older units, which then logically will push potential buyers of more modern carriers to newbuildings.

Camillo Eitzen, who took over the Kil fleet several years ago, has bought the fleet of his Norwegian compatriot Igloo for about \$ 75 million (7 ethylene carriers of 8,000 to 10,000 cbm, built between 1982 and 1989). This same owner then bought the Gibson Tankers fleet (3 carriers of 6,000 cbm built in 1982 and 2 carriers of 3,500 cbm built in 1991).

In the pressurised sector, the sale of the Japanese owner's Far East Shipping fleet (9 carriers of 3,500 cbm built between 1996 and 2003 and two car-



**Gas Sriracha**  
3,514 cbm, built in 1996  
by Uzuki Zosencho, sold  
to Centaurus Transport Ltd  
and now renamed 'Grampian'

riers of 5,000 cbm built in 1994 and 1995) to Exmar Kosan, for about \$ 85 million, caused quite a sensation at the end of the first quarter. The reported values revealed a price varying from \$ 6 million for a carrier of 3,500 cbm built in 1996 to \$ 9,5 million for one delivered in 2003 on one hand, and on the other hand a price of around \$ 7 million for carriers of 5,000 cbm. These values show an increase of 20 % over the lowest levels achieved for comparable ships in 2002 and 2003.

During the third quarter with freight rates reaching more encouraging levels, the market saw the entrance of a new name in the LPG sector, the Greek Vafias, buyer of 9 pressurised and semi-ref LPG carriers of 1,500 to 6,500 cbm. The level of prices paid put the value for 10 year old pressurised carriers of 5,000 cbm and 3,500 cbm at respectively around \$ 12 and \$ 8,5 million. In the same way, the purchase of two semi-refs of 3,500 cbm built at the beginning of the 1990s, allowed these ships to obtain in 2004, prices above those reached in 2000 and above all a 70 % increase over the prices they got in 2003. As an illustration, it is worth recalling that freight rates for a 12-month period has been following a similar evolution: \$ 220,000 in 2000, \$ 170,000 in 2003, and about \$ 320,000 at the end of 2004.

If it maintains, the improvement in freight rates should encourage a revival of newbuilding orders although construction costs are higher and since the second-hand market offers too few opportunities for the renewal of fleets. ■