U.S. Department of Transportation
Maritime Administration

Coastal Tank Vessel Market Snapshot, 2009

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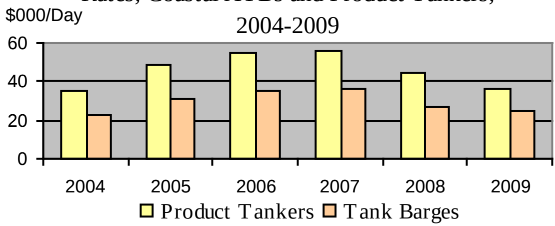
Introduction

The double-hulling of U.S. coastal tank vessel fleets, which is required by the Oil Pollution Act of 1990 (OPA-90), will be virtually complete over the next 3 years.[1] The double-hulling process accelerated over the last 5 years as non-double-hull vessels built during the 1978-1983 boom period reached their OPA-90 phase-out dates. From 2004 to 2007 tank vessel charter rates increased significantly as old, non-double-hull tank vessels were removed from service. However, the deployment of new double-hull vessels and the decline in coastal tank vessel trades have contributed to the post 2007 decline in rates (Figure 1).

Figure 1. Time Charter Equivalent (TCE) Rates, Coastal ATBs and Product Tankers, 2004-2009



TCE rate = (voyage revenues - voyage costs)/voyage days.
Source: Overseas Shipholding Group, 10-Q reports.

Trades

U.S. coastal tank vessel trades are served by crude carriers, product tankers and tank barges (including articulated tug/barge units (ATBs)). Crude carriers serve the Alaska/West coast crude oil trades; product tankers serve the coastal and inter-coastal petroleum products and chemicals trades, and supplement crude carriers in the Alaska/West coast crude oil trades; and tank barges serve

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[1] 46 U.S.C. 3703a. (2005).

coastal and short-haul inter-coastal petroleum products and chemicals trades. Product tankers and tank barges also lighter imported crude oil at U.S. Atlantic and Gulf ports. [1] Over the last five years, domestic tank vessel trades (metric tons and average hauls) have declined due largely to a 10 percent decline in U.S. consumption of petroleum products Tables 1 and 2).

Table 1. U.S. Coastal Tank Vessel Trades, 2004-2009

							% Ch.
Vessel Type	2004	2005	2006	2007	2008	2009e	2004-09
Prod. Tankers							
Mil. Metric Tons	44.6	41.2	38.0	38.2	34.7	36.3	-18.6
Bill. Ton-Miles	64.5	58.3	44.1	43.6	35.5	40.3	-37.5
Average Miles	1,447	1,415	1,161	1,142	1,023	1,110	-9.2
Crude Carriers							
Mil. Metric Tons	39.6	36.2	30.4	32.1	30.5	28.2	-28.8
Bill. Ton-miles	73.0	64.7	51.3	55.4	52.4	46.8	-35.9
Average Miles	1,844	1,789	1,688	1,728	1,718	1,660	-10.0
Tank Barges							
Mil. Metric Tons	70.1	66.0	67.4	71.5	65.6	67.3	-4.0
Bill. Ton-miles	31.9	28.5	30.3	30.6	27.3	28.6	-10.3
Average Miles	455	432	449	428	416	425	-6.6
Total, Domestic							
Mil. Metric Tons	154.3	143.4	135.8	141.8	131.9	131.8	-14.6
Bill. Ton-miles	169.4	151.5	125.7	129.6	117.6	115.7	-31.7
Average Miles	1,098	1,058	926	1,094	892	878	-20.0
Imports							
Mil. Metric Tons	590.9	604.5	583.2	571.4	543.1	497.7	-15.8

e Estimates.
Source: U.S. Army Corps of Engineers, Waterborne Commerce of the United States, detail files.

[1] Lightering of crude oil generally involves the use of a tank barge or product tanker to carry cargo from a crude carrier to a U.S. port in order to reduce the crude carrier draught. This operation is usually carried out when the loaded draught of the ship is too deep to enter a U.S. port. In 2008, product tankers lightered 5.3 million metric tons, and tank barges lightered 6.8 million metric tons.

The decline in tank-barge trades was less than that in the tanker trades reflecting a substitution of tank barges for product tankers in the inter-coastal product trades (See coastal tank vessel fleets below).

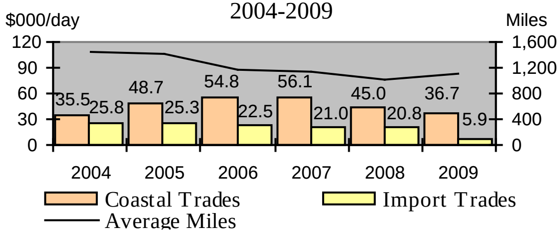
Table 2. U.S. Petroleum Products Supplied (Consumption) by Source, 2004-2009
(Million Barrels)

							% Ch.
	2004	2005	2006	2007	2008	2009	2004-09
Domestic	2,776	2,587	2,548	2,632	2,396	2,540	-8.5
Foreign	4,811	5,006	5,003	4,916	4,727	4,280	-11.0
Total	7,588	7,593	7,551	7,548	7,136	6,820	-10.1

Source: Energy Information Agency, Petroleum Supply Annual.

Average hauls in coastal product tanker trades are much shorter than those in U.S. import trades. For example, Rotterdam to New York, a major import trade, is about 3,400 nautical miles, while Houston to Port Everglades, a major coastal trade, is only 1,010 nautical miles. While daily charter rates for coastal product tankers are much higher than those in the import trades, the voyage charter costs (charter rate x voyage days) in the coastal trades are more in line with those in the import trades. As coastal charter rates increase relative to those in the import trades, average hauls (voyage days) in the coastal trades tend to decline and vice versa (Figure 2).

Product Tanker Charter Rates and Average Haul in U.S. Coastal Product Tanker Trades, 2004-2009



TCE rate = (voyage revenues - voyage costs)/voyage days.
Source: Overseas Shipholding Group, 10-Q reports.

Fleets

Over the last five years, 71 single-hull vessels were removed from service while 89 new or rebuilt double-hull vessels entered service. For the same period, fleet capacity increased by 164 thousand deadweight tons, contributing to the decline in coastal charter rates (Table 3).[1]

Table 3. Coastal Tank Vessel Fleets and Orders, 2004, 2009
(DWT in Thousands)

	2004 Fleet		2009 Fleet		2009 DH*		On Order	
Type	No.	DWT	No.	DWT	No.	DWT	No.	DWT
Tank Barges	103	1,825	134	2,413	127	2,335	10	275
Tankers	74	4,333	60	3,996	42	3,164	13	626
Crude	18	2,690	12	1,853	12	1,853	0	0
Product	46	1,959	48	2,143	30	1,311	13	626
Total	177	6,158	194	6,409	169	5,499	23	901

* DH-Double-hull.
Sources: Tankers – Clarkson Research Studies; Tank Barges – U.S. Army Corps of Engineers, Marine Log, and American Bureau of Shipping.

Crude Carriers As of year-end 2009, the U.S. coastal crude carrier fleet amounted to 12 double-hull vessels of 1.9 million DWT. Over the last 5 years, the major oil companies took delivery of 4 double-hull crude carriers (0.7 million DWT) for the Alaska/West Coast crude oil trades. Over the same period, 10 single-hull crude carriers of 1.6 million DWT were removed from the trade.

Product Tankers The U.S. coastal product tanker fleet amounted to 48 product tankers of 2.1 million DWT as of year-end 2009. Thirty of these (1.3 million DWT) were equipped with double hulls. Thirteen double-hull product tankers (0.6 million) were added to the fleet since 2004. Over the same period 11 (0.4 million DWT) single-hull

[1] Deadweight (DWT) is the total weight (metric tons) of cargo, fuel, fresh water, stores and crew which a ship can carry when immersed to its load line.

product tankers were removed from the coastal trades. As of year-end 2009, 13 double-hull product tankers amounting to 29 percent of the existing fleet DWT were on order.

Tank Barges As of year-end 2009, the coastal tank barge fleet amounted to 134 vessels of 2.4 million DWT. Of these, 127 (2.3 million DWT) were equipped with double hulls. Over the last 5 years, 62 new/rebuilt double-hull tank barges amounting to 1.1 million DWT were added to the fleet, while 31 single-hull tank barges amounting to 0.5 million DWT were removed from service. As of year-end 2009 ten double-hull tank barges amounting to 11 percent of the existing fleet DWT were scheduled for delivery over the next 3 years.

Productivity, Attrition and Orders

New tank vessels are more productive than those they replace because they require less maintenance and dry-docking time than older vessels; and they have 2-3 times more pumping capacity (less load/discharge time) than older vessels. Also, new ATBs are faster and more seaworthy than traditional tug/barge units.[1] In 2007, the peak year for rates, tank barges less than 10 years old produced 17,322 ton-miles per DWT, while older barges produced 12,410 ton-miles per DWT (Table 4). Product tankers less than 10 years old produced 34,952 ton-miles per DWT compared to 25,219 for older tankers. The figures in Table 4 suggest that 3 new product tankers are equivalent in productivity to about 4 traditional (10+ years-old) vessels; and likewise for ATBs.

[1] Articulated tug/barge units (ATBs) are large, 10,000+ DWT tank barges with hinge-like connections between the tug and the barge that increases the stability, speed and maneuverability of the tug barge unit compared to traditional units.

Table 4. Tank Vessel Productivity, 2007*
(Ton-Miles Per DWT)

Fleet/ Age	Thousand DWT	Million Ton-Miles	Ton-Miles/ DWT
Crude Carriers			
<10 Years	1,409	42,012	29,817
>=10 Years	568	12,213	21,502
Total	1,977	54,225	27,428
Prod. Tankers			
<10 Years	166	5,803	34,952
>= 10 Years	1,335	33,668	25,219
Total	1,501	39,471	26,296
Tank Barges			
<10 Years	1,121	19,418	17,322
>=10 Years	815	10,114	12,410
Total	1,937	29,532	15,246

* Excludes vessels that operated part of the year.
Source: U.S. Army Corps of Engineers, Waterborne Commerce of the United States, detailed files.

Another factor that has contributed to the productivity of new tank barges is the tendency to deploy them in longer trades (Table 5). Assuming 3 port days and 10 knots, a fully-employed tank barge is about 42 percent more productive in a 500-mile trade than in a 250-mile trade.[1]

Table 5. Tank Barge Traffic by Age of Vessel and Route Miles, 2008
(Million Metric Tons)

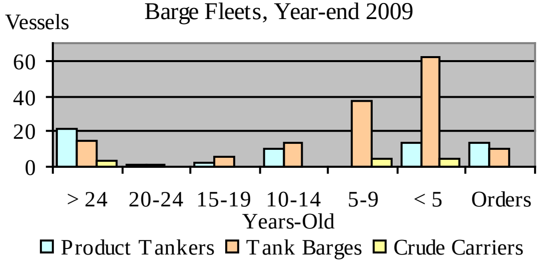
Age/Miles	>= 500 mi.	< 500 mi.	Total
<10 Years	15.0	27.8	42.8
>= 10 Years	5.8	17.1	22.9
Total	20.8	44.9	65.6

Source: U.S. Army Corps of Engineers, Waterborne Commerce of the United States, detailed files.

[1] A 30,000 DWT tank barge generates 735 million ton-miles per year on a 500 mile route (49 voyages x 30,000 metric tons x 500 miles), while the same barge generates 518 million ton-miles per year on a 250 mile route (69 voyages x 30,000 metric tons x 250).

As of year-end 2009, 74 percent of the tank barges were less than ten years old, while only 27 percent of the product tankers were less than ten years old (Figure 2). By 2012, about 67 percent of the coastal product tankers will be less than ten years old.

Figure 3. Age Profiles for Tanker and Tank Barge Fleets, Year-end 2009



Sources: Clarkson Research Studies for tankers, U.S. Army Corps of Engineers, Marine Log and ABS for barges.

The surge in tank vessel orders was due largely to a 2004-2007 increase in charter rates for domestic product tankers and large tank barges. For the period 2004-2007, the time charter equivalent (TCE) rate for a 45,000 DWT double-hull product tanker increased by 58 percent to $56,100 per day, while the TCE rate for a 30,000 DWT double-hull ATB increased by 59 percent to $36,400 per day (Table 6).[1] The 2007 rates, if sustained, would have resulted in an 11 percent return on investment in new product tankers and a 14 percent return on investment in new ATBs.[2] However, product tankers and ATBs are typically delivered 2-3 years after the contract date, and tank vessel charter rates can fall significantly before new vessels are delivered.

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[1] Overseas Shipholding Group, 10 K and 10 Q reports.
[2] The rate-of-return estimates are based on a 25-year asset life, new-build prices of $110 million and $65 million for the product tanker and ATB, and daily operating costs of $20,000 and $12,000 for the vessels.

In 2009, rates for ATBs were down 32 percent from two years before, and rates for product tankers were down 35 percent over the same period.

Table 6. Time Charter Equivalent (TCE) Rates, Coastal ATBs and Product Tankers, 2004-2009 *
($000/Day)

	Foreign	Domestic	
Year/ Quarter	Tanker 45,000 DWT	ATB 30,000 DWT	Tanker 45,000 DWT
2004	25.8	22.9	35.5
2005	25.3	30.6	48.7
2006	22.5	35.3	54.8
2007	21.0	36.4	56.1
1	28.3	41.9	64.8
2	29.7	37.0	56.7
3	12.9	33.2	51.1
4	13.3	33.6	51.8
2008	20.8	27.1	45.0
1	17.3	31.5	51.0
2	28.3	21.4	38.9
3	23.3	23.9	39.7
4	14.3	31.6	51.4
2009	5.9	24.9	36.7
1	11.0	30.5	46.6
2	6.8	22.2	31.9
3	3.0	23.0	33.1
4	2.7	23.8	34.9

*TCE rate = (voyage revenues-voyage costs)/voyage days.
Source: Overseas Shipholding Group, 10-Q reports.

The upgraded product tanker and tank barge fleets will be able to generate a combined 95 billion ton-miles of service (Table 7). The estimate excludes vessels older than 25 years. To keep vessel utilization and charter rates from declining further, coastal trades (ton-miles) would have to increase by about 24 percent, which is unlikely given competition from offshore sources. Also, there is limited potential for additional tank vessel removals (market correction) for at least five years after the new vessels enter service (See 20-24 year old fleet in Figure 3).

Table 7. Estimated Service Capacities, Product Tanker and Tank Barge Fleets, 2009 and 2012*
(DWT in Thousands)

Type/Age	DWT		Ton-miles/	Service Capacity Bill. Ton-Miles	
	2009	2012	DWT	2009	2012
Product Tankers	1,367	1,756		40.6	56.4
< 10 Years	624	1,250	34,952	21.9	43.6
10-25 years	743	506	25,219	18.7	12.8
Tank Barges	2,154	2,428		35.5	38.3
< 10 years	1,787	1,665	17,322	30.9	28.8
10-25 years	367	763	12,410	4.6	9.5
Total	3,521	4,184		76.1	94.7

* Excludes vessels older than 25 years.
Source: U.S. Army Corps of Engineers, Waterborne Commerce of the United States, detailed files for non-estimates.

Conclusion

The U.S. coastal product tanker and tank barge fleets will be significantly upgraded by 2012. Given the expansion of service capacities, tank vessel operators will face a significant risk of underutilized vessels and reduced earnings over the next five years.

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