SHIPPING – THE ENABLER OF GLOBALIZATION AND GROWTH

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Greek shipping

Greeks control probably the biggest fleet in carrying capacity (tdw). It is also the youngest. **We have succeeded as cost efficient cross traders providing competitive transport services for other peoples' cargoes.**

The average size of Greek controlled ships is about **63.500 tdw**. The world's average ship is about 24.600 tdw. The average size of world ships, excluding Greek ships, is about **22.250 tdw**.

Greek ships are on average 2.85 times bigger than the rest. It follows that Greek shipping transports a major share of international, longer distance trade.

The Greek fleet is considered a reliable, strategic partner for the transport requirements of all major trading nations.

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Greek controlled energy shipping

Greek shipping represents **15.6%** of world ship transport capacity and **42.7%** of the European fleet.

Greek controlled **tanker fleet** represents **23.55%** of the world fleet.

Greek controlled **bulk carrier fleet** represents **17.20%** of world fleet.

Greek controlled **chemical and products fleet** represents **12.8%** of world fleet.

Greek controlled **liquid gas fleet** represents **7.44%** of world fleet.

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Shipping and the Greek economy

Greek shipping produces inflows of between **€13 and €19 billion annually** to the Greek economy depending on market conditions. Ocean going shipping represents about **7% of GDP**. It also directly and indirectly employs about **300.000 people**.

Today there are about **720** shipowning/management firms operating out of Greece employing about **12.000** people managing over **3.300 ships** totaling over **220 million tdw**. Many ships of foreign ownership are also operated out of Greece.

In view of the numbers and the diversity of ships, the available expertise in the greater Athens area is second to no-ones. Many international service providers, foreign banks, P+I Clubs, lawyers, brokers, Classification Societies and others have regional offices in Greece. **More will surely come**.

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Cost efficiency of Shipping

- Dry bulk shipping's cost efficiency improved about **33%** over the last 31 years through larger, more cost efficient shipping. The average size of the fleet grew from **35.500 tdw** in 1981 to **70.600 tdw** in 2012.

- Similar cost efficiency improvements have occurred in all sectors of shipping.

- Ships' sizes are constantly increasing. All ship categories suffer bracket creep.

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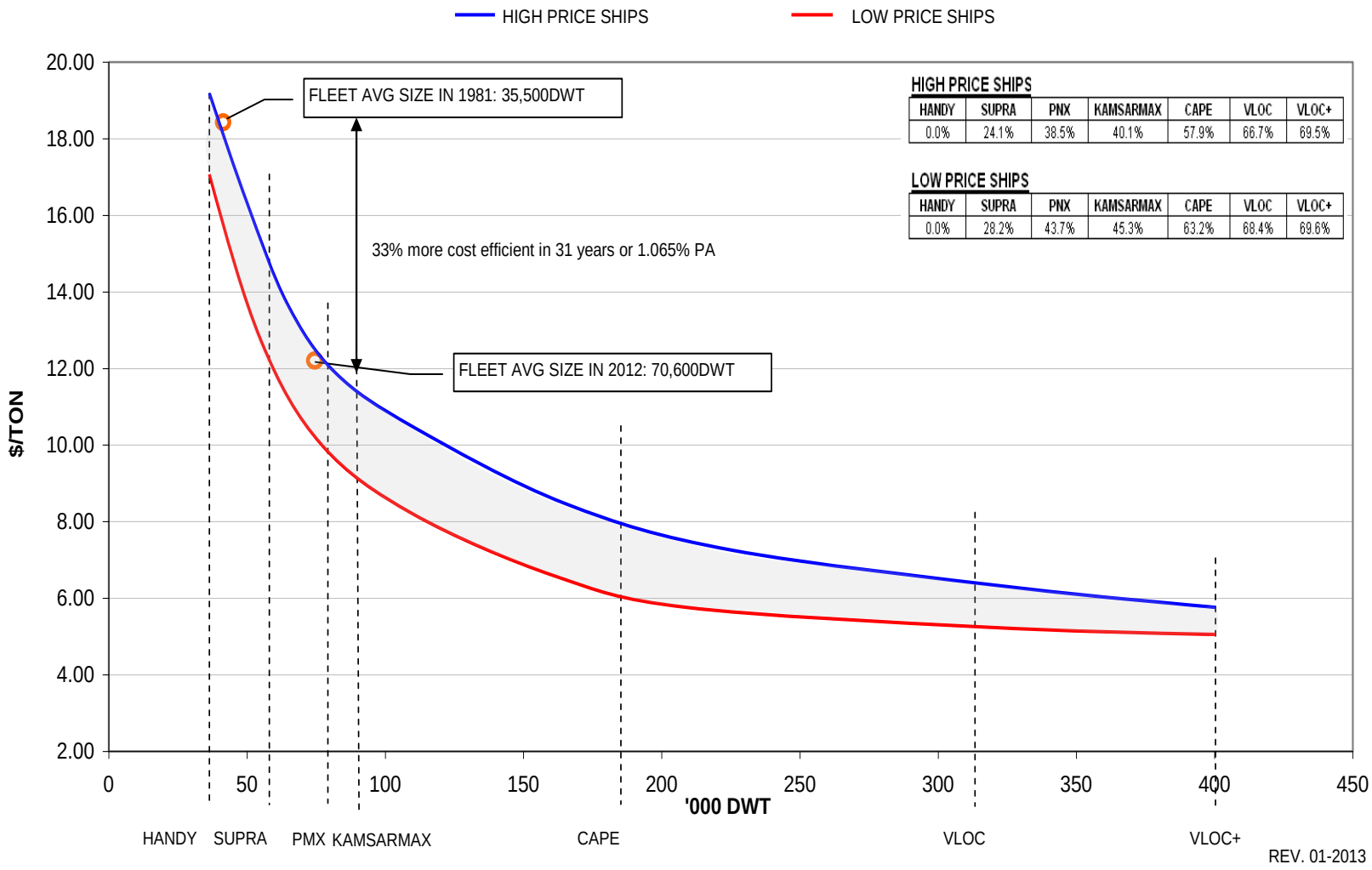
COST EFFECTIVENESS OF DIFFERENT SIZE BULK CARRIERS CARRYING A FULL CARGO FROM DAMPIER (AUSTRALIA) TO QUINDAO (CHINA) ON A ROUND TRIP BASIS



HIGH PRICE SHIPS

HANDY	SUPRA	PNX	KAMSARMAX	CAPE	VLOC	VLOC+
0.0%	24.1%	38.5%	40.1%	57.9%	66.7%	69.5%

LOW PRICE SHIPS

HANDY	SUPRA	PNX	KAMSARMAX	CAPE	VLOC	VLOC+
0.0%	28.2%	43.7%	45.3%	63.2%	68.4%	69.6%

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Shipping energy efficiency

- Shipping has always been the most energy efficient and environmentally friendly form of transport emitting only about **2.7%** of the world's Green House Gases. Shipping contributes only **12%** to marine pollution.

- When ships slow steam they consume less fuel. **Ships sail at the speed at which they maximize profits**. They go slow in poor markets and speed up in good markets. Average speeds occur in average markets.

- Bigger ships are also more energy efficient cargo transporters than smaller ships.

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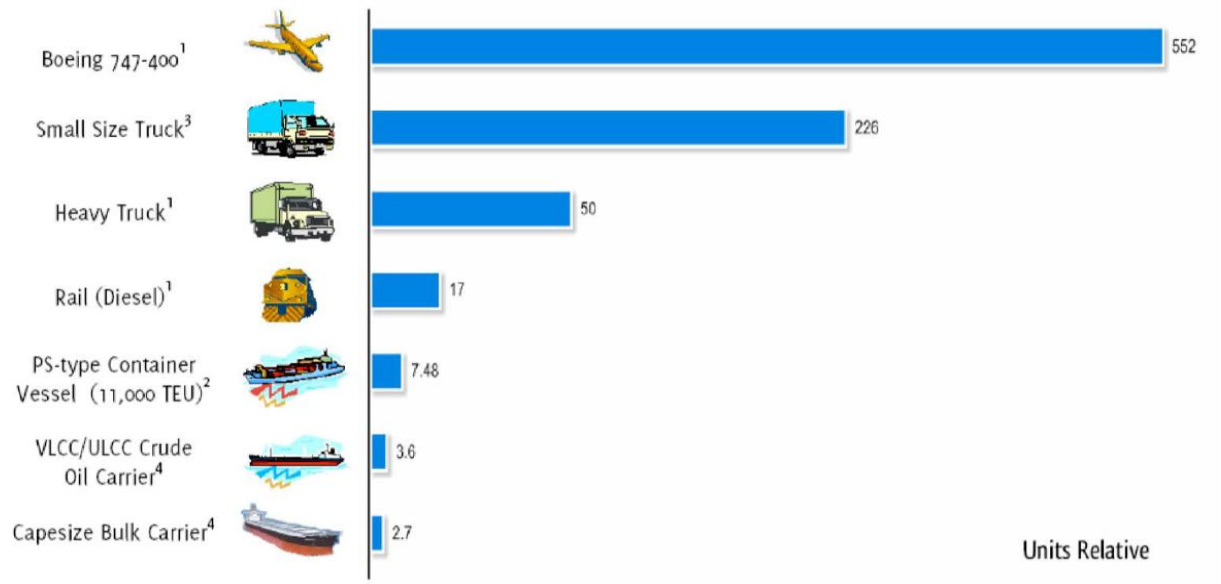
Ship size vs. flexibility

- Bigger ships fit into less ports and are limited by waterway restrictions.
- Port infrastructure expansion is easier justified in ports of projected high cargo throughput.

Ships must be appropriate for the envisaged trade.

COMPARISON OF CO_2 EMISSIONS AMONG TRANSPORT MODES

(grams per tonne-kilometer)



Sources:

1 Swedish Network for Transport and the Environment (NTM)
2 Maersk Line
3 Man B&W Diesel
4 National Technical University of Athens (NTUA)

Produced by
NTUA Laboratory for Maritime Transport
www.martrans.org

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Shipping conforms to:

The laws of nature, which are well thought through and consistent

Manmade regulations which, not being as inspired, some times create more problems than they solve despite the fact that knowledge and experience is ever expanding

To be effective, ship energy efficiency must be examined and regulated taking into account the laws of nature.

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Ship energy efficiency

More energy efficient ships are a reality and will be **“game changers”.**

The basic technologies have been known, tried and tested for decades, if not centuries. The basic trade-off is cargo intake revenue vs. bunker consumption cost for every ship segment, in order to increase profitability. **The ratio BDI/BP is key.**

Energy efficient bulk carriers and tankers are about **20%-30%** more fuel efficient than ships presently operating.

For a **75.000 tdw** ship this represents a difference in average transport costs of about **$3,000/day** at bunkers costing **$700/ton** over a trading year. This income differential will depress the earning capacity and prices of existing similar tonnage going forward.

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THE TECHNOLOGIES HAVE BEEN KNOWN FOR A LONG TIME

Hull form is very important

- A racing skiff does ~10 kn with 1 M-P
- A light rowboat does ~2.5 kn with 1 M-P

Slow speed engines and propellers

"Propeller efficiency usually increases with increasing diameter" … "A reduction of the RPM tends to be beneficial" "Muntjewerft in 1983 mentions a possible increase of propulsive efficiency of 10 to15 pct" (PNA-1988)

In 1981 Burmeister & Wain produced their MKIII 65.000 tdw Panamax bulk carrier with improved hull, engine and a slow turning 6.9 m diameter propeller doing 82 RPM @75% MCR, thus creating a very energy efficient ship.

The ship at scantling draft traded at 13.5 kn consuming 26 t/day.

Its consumption was about 25% less than other ships built at the time.

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World energy needs

- Until 2000 world energy consumption per unit of GDP appeared to have a declining tendency as economies improved energy efficiency because of mounting costs.

- This trend plateaued for the last decade or so mainly because of the rapid industrialization of emerging economies.

- We expect that as time goes on, constantly improving energy efficiency as emerging economies mature will once again make inroads on energy consumption. The trend will therefore, once again, start pointing downwards.

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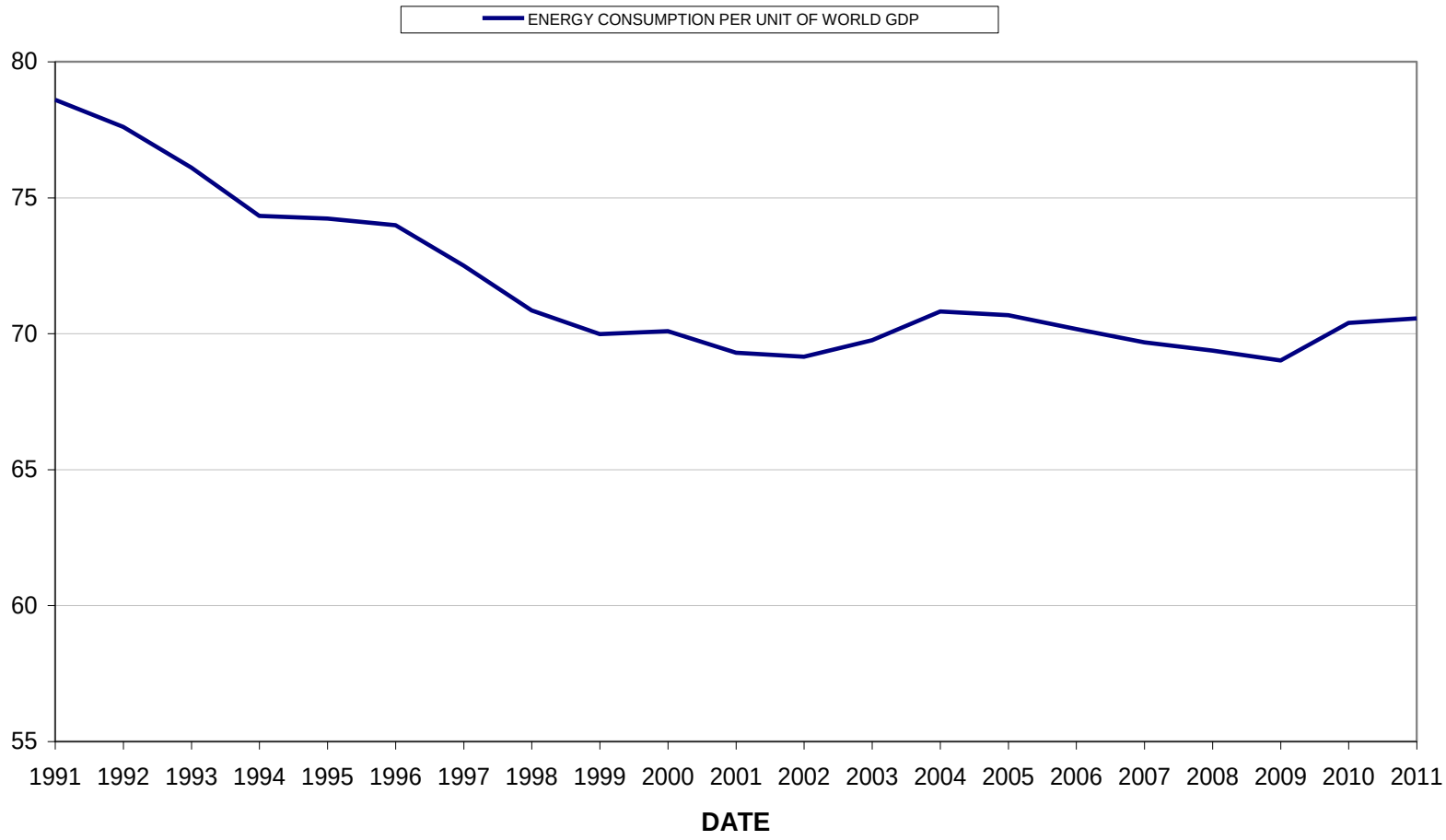
PRIMARY ENERGY CONSUMPTION PER UNIT OF WORLD GDP, (GDP_{1989}=100)



SOURCE: BP STATISTICAL REVIEW , IMF

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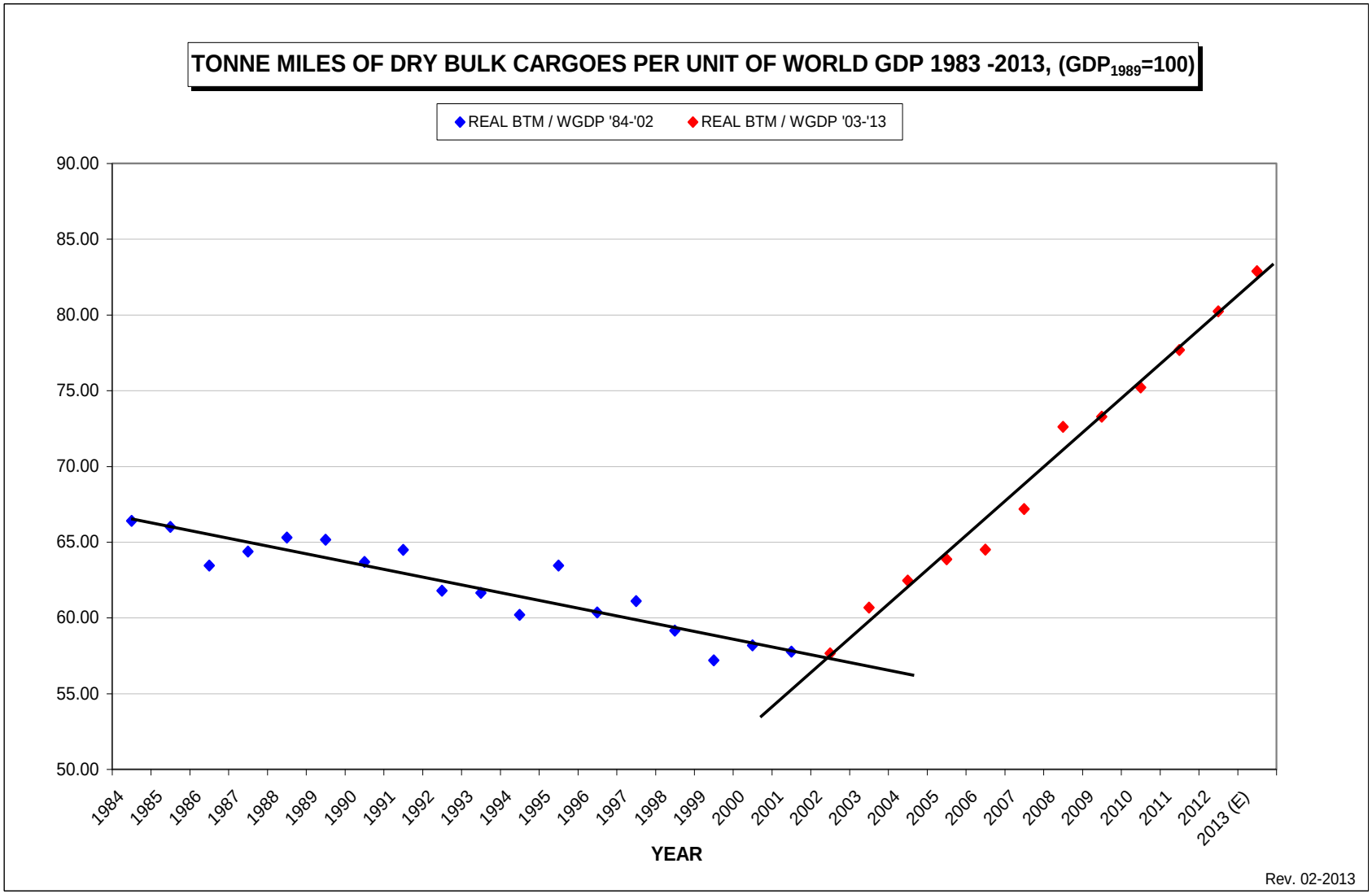
TONNE MILES OF DRY BULK CARGOES PER UNIT OF WORLD GDP 1983 -2013, (GDP1989=100)
REAL BTM / WGDP '84-'02
REAL BTM / WGDP '03-'13
90.00
85.00
80.00
75.00
70.00
65.00
60.00
55.00
50.00
1984
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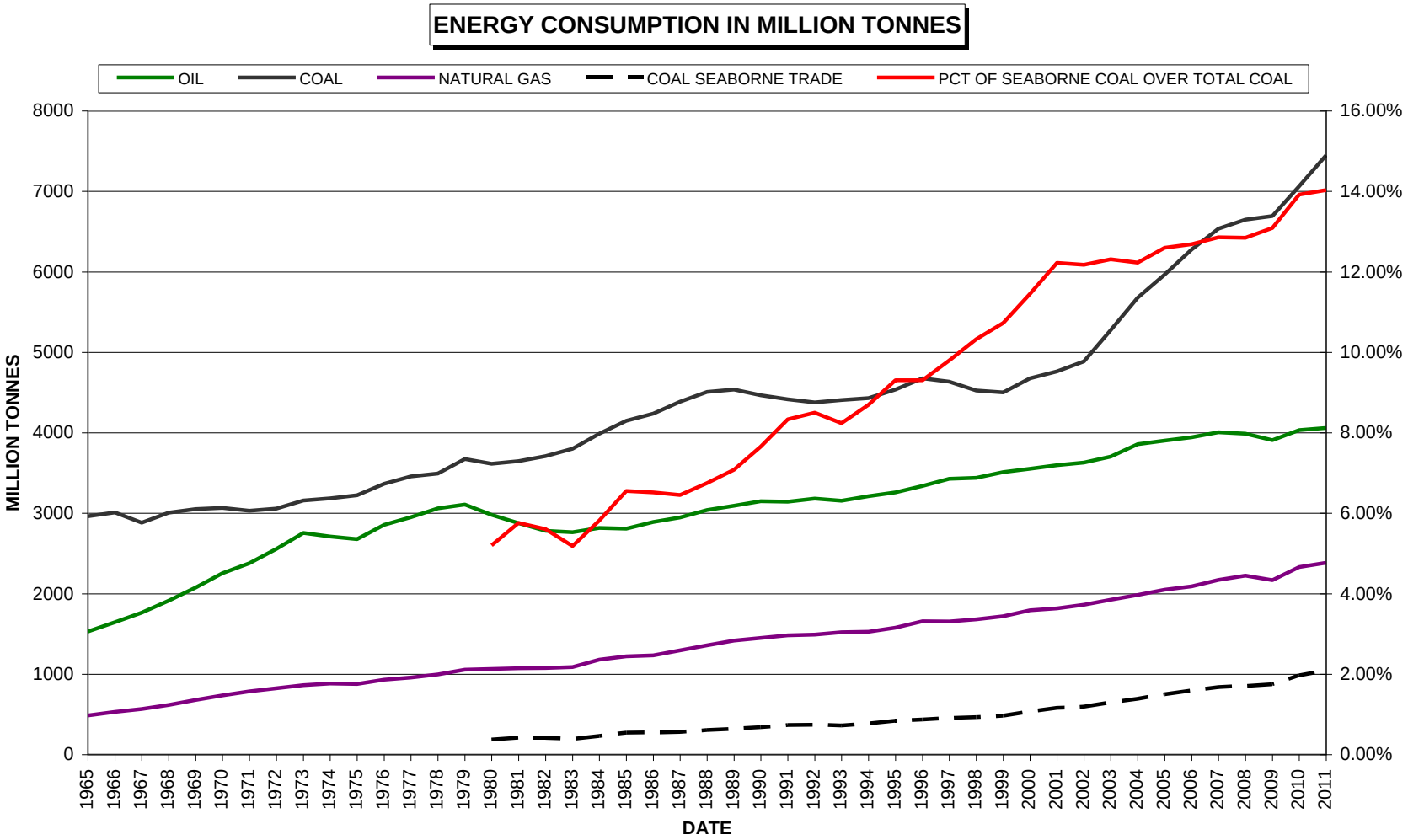

SOURCE: BP statistical review of world energy, R.S. PLATOU

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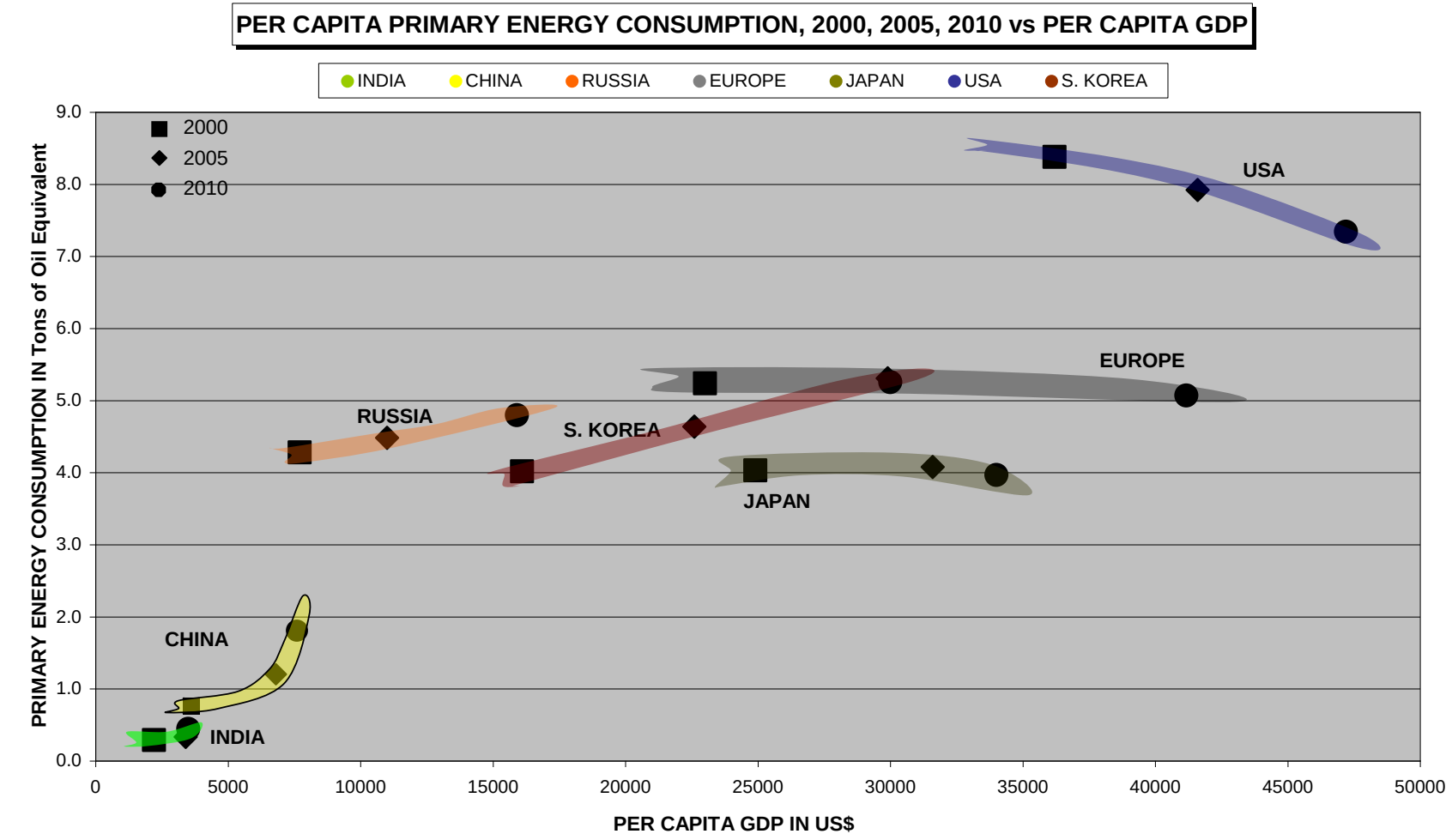
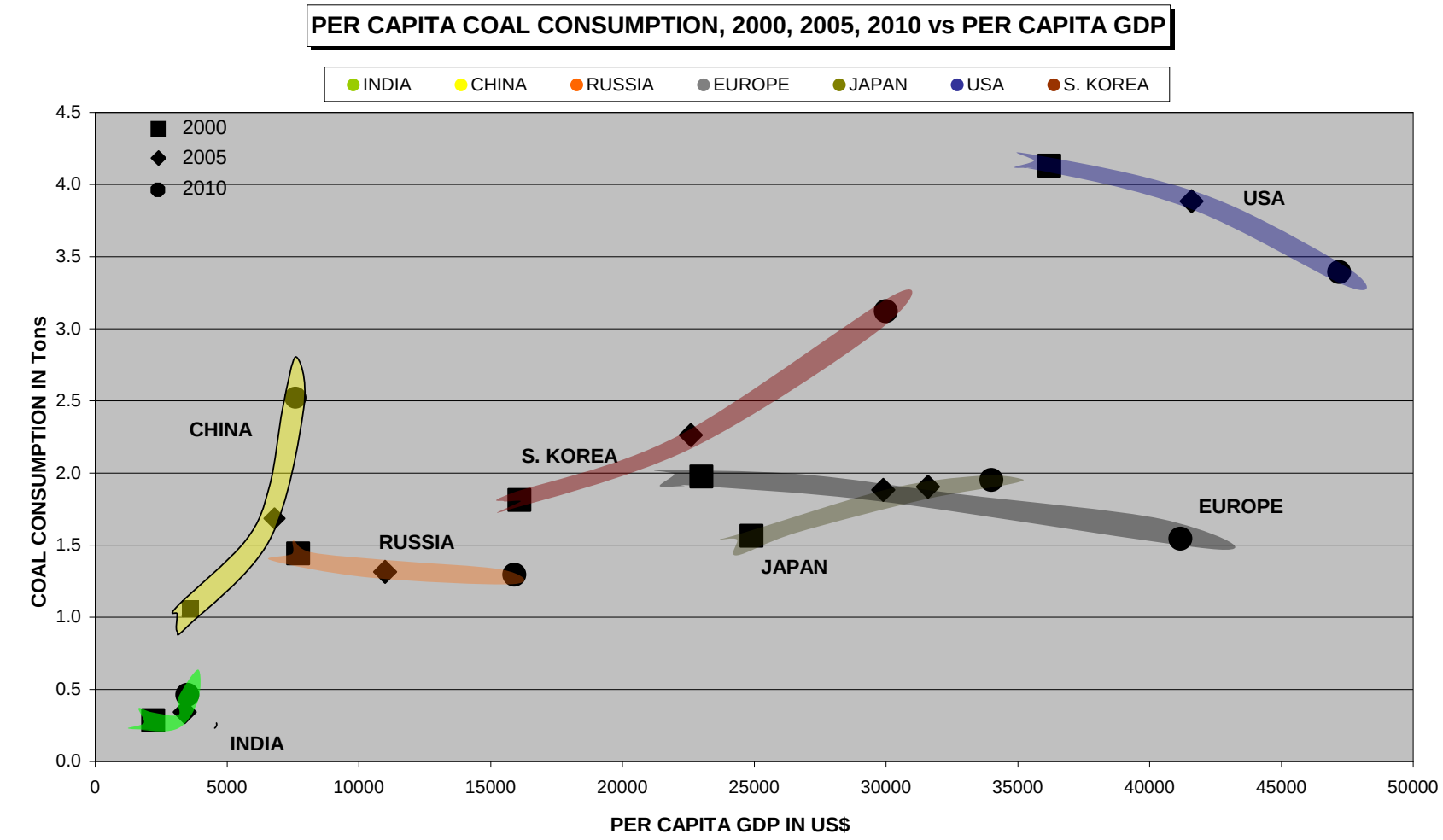
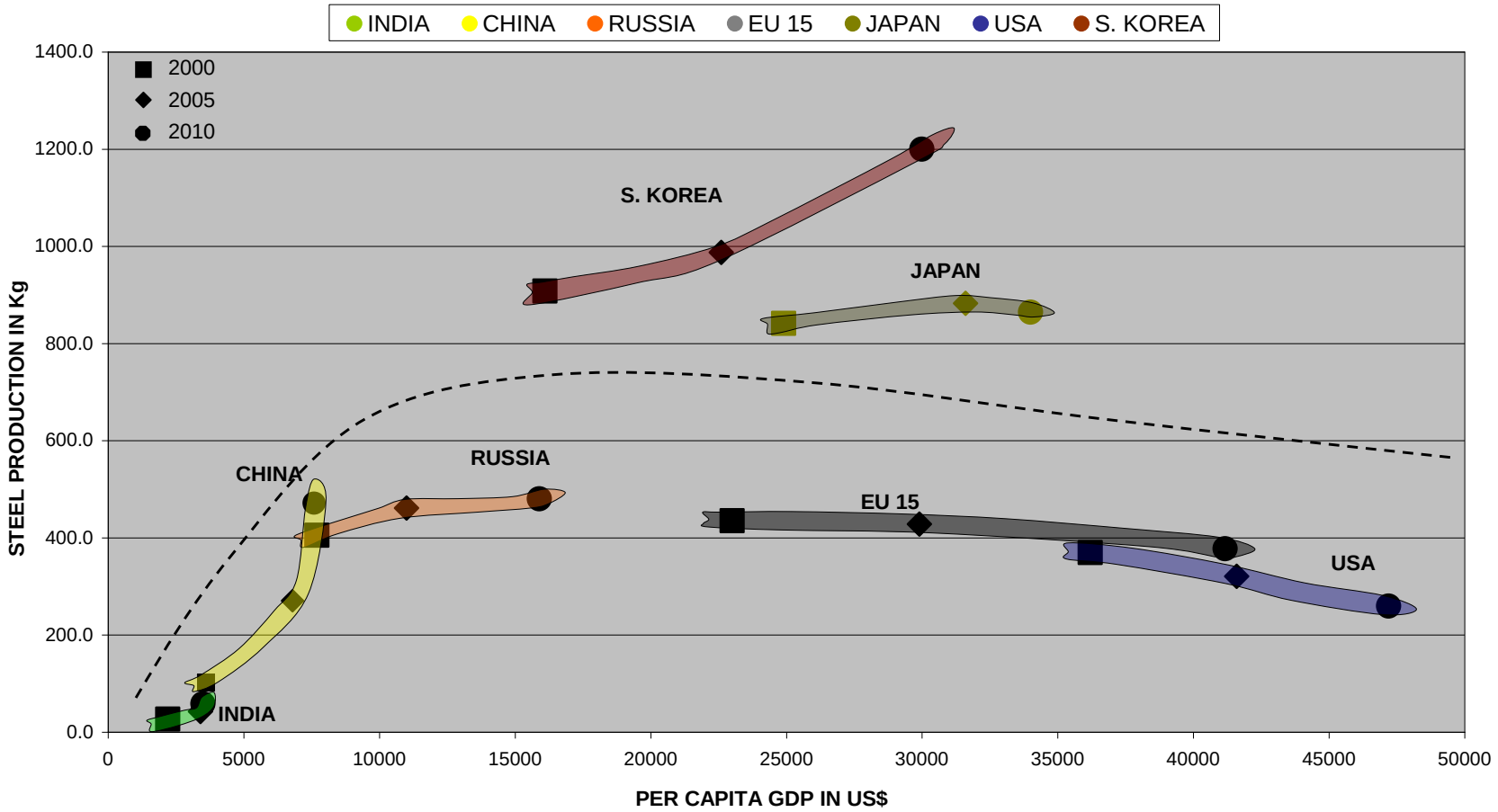


SOURCE: BP, CIA, IMF, Population Reference Bureau



SOURCE: BP, CIA, IMF, Population Reference Bureau

PER CAPITA STEEL PRODUCTION, 2000, 2005, 2010 vs PER CAPITA GDP



SOURCE: BP, CIA, IMF, Population Reference Bureau

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Seaborne energy transport

- Coal transported by sea increased from about **5%** of world consumption in 1980 to **14%** world consumption in 2011. This indicates that more and more of the coal consumed is imported from other destinations by shipping.

- The average distances shipped though appeared to be somewhat smaller reducing to **4.800** miles in 2011 from **5.100** in 1980. This is due to the emerging Asian economies importing more from sources closer to them. With ever increasing demand this distance will probably increase.

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“Any intelligent fool can make things bigger, more complex and more violent. It takes a touch of genius – and a lot of courage – to move it in the opposite direction” Einstein

Complex regulations though appear to be the trend!

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Regulations

Manmade regulations to-date have not managed to produce the envisaged results. This can be seen both in socioeconomic and environmental regulations.

This is due to the lack of clear, rational thinking, which leads to complicated, unworkable structures.

To motivate people, regulations must be simple and stable over time. Both the cost and the envisaged benefit should be clearly defined and shown. Much as the laws of nature.

“Everything should be made as simple as possibly, but not simpler” Einstein

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Conclusion

With good, well thought and stable regulations, as emerging economies mature and the price of energy rises the world will become more energy efficient.

Renewable energy sources will produce increasing amounts of energy.

Both these factors will probably reduce the rate of growth of demand for seaborne energy transport.

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Thank you

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