Dredging in Figures is an annual review of the global dredging market. The document focusses on the global dredging and maritime construction industry over 2012. The IADC aims to be thorough and precise in estimating the figures presented in this document. The statistics provided here are based on information from international sources as well as from IADC member companies.

MARITIME SOLUTIONS FOR A CHANGING WORLD

The worldwide need for maritime construction keeps changing and so do the technologies offered by the dredging industry. Increased demands for clean energy, increased migration of peoples within countries and internationally, and growing urban hubs as well as threats from rising sea level are a few of the challenges that demand innovative dredging solutions. Although the downturn in the global economy which began in 2008 continued in 2012, the drivers which affect the dredging industry continue to stimulate demand. The growth of waterborne trade, urbanisation and infrastructure expansions, offshore and alternative energy and climate change concerns remain in the forefront of the global economy. These have resulted in investments in innovations and solution-oriented approaches by the dredging industry. Together they have led to a 7% financial growth of the market as a result of exchange rate changes between the renminbi (CN¥) and the euro. Dredging in Figures examines the industry drivers, as well as the market turnovers in different regions for different market drivers.

Despite economic uncertainty, dredging contracts for new projects for port development and the offshore industry have been strong in 2012. Especially in South America and Australia, new port infrastructure is being built. In the US substantial funds for postponed harbour maintenance and expansion work have been allocated and work is underway to remedy the lack of depth at various ports to meet post-Panamax requirements. In the EU region and elsewhere in Europe, austerity measures have resulted in prudent financial policies, but many investments in new infrastructure remain on the drawing board for future development. In China, the quantity of dredged material (in cubic metres) in 2012 remained fairly similar to 2011, although the overall turnover (measured in euros) has grown substantially as a result of currency exchange rates favouring the renminbi.

International institutions such as IMF, OECD, UNCTAD and others provide well-supported future outlooks on urbanisation. Graphs of the other drivers for the dredging industry give overviews of the historical situations.

WHAT DRIVES DREDGING?

Worldwide economic prosperity, as well as social and environmental well-being, is directly related to dredging, in particular to the construction and maintenance of the maritime infrastructure. In July 2013 the world’s largest container ship – the first Triple-E ship – commenced its maiden voyage from Busan, South Korea to Copenhagen, followed by number 2 in August and number 3 in mid-September. A fourth vessel in the Triple-E series will be departing in October. In total 20 Triple E ships will come into service in the next two years. Dredging is necessary to ensure port expansion and maintenance, so that these ships will be able to enter a sufficient number of ports.

The offshore industry is as well dependent on dredging, pre-sweeping, trenching and backfilling for pipelines and stabilising platforms. These techniques allow the offshore industry to explore deep waters for oil and gas in remote parts of the world. Dredging also services offshore windmill platforms.

The threat of flooding is addressed by the dredging industry as they build coastal defences, storm-surge barriers and reinforce shorelines to prevent erosion. High-tech, highly specialised and capital-intensive – those are a few adjectives that describe dredging. On average the educational level of employees at the major private dredging companies is exceptionally high, with 40-50% having a bachelor’s degree or higher.

In recent years the major international dredging companies have broadened their operations, developing from sub-contractors to main contractors to Engineering, Procurement and Construction (EPC) contractors. This allows them to offer more comprehensive solutions to clients. Also, they are offering more varied career opportunities to their employees.
The impact of dredging on the global economy is, in fact, far greater than its effect on direct employment or industry turnover.

ENVIRONMENT
Incorporating environmentally sound working methods is an integral part of most major dredging projects. In most instances an environmental impact study/assessment is a pre-requisite prior to the start of the dredging project. Environmental procedures are then integrated into the totality of the work – before, during and after. Remediation of contaminated soil during maintenance dredging is common. This may also be linked to capital dredging projects for new maritime infrastructure. When adverse environmental impacts are expected these are usually mitigated or compensated in accordance with local, regional and/or international environmental regulations. Compensation often produces new nature preserves, wetlands and marine habitats, which then enhance tourism and urban development. Remediation projects of historically contaminated industrial sites, such as brownfields, are in and of themselves important capital projects.

In recent years, this attention to environment and sustainability has resulted in the development of several programmes known as “Working”, “Engineering” and “Building with Nature”. These activities, often in public-private partnerships, are devoted to research and testing of innovative operational methods. The aim is to create a synergy between ecology and socio-economic development when planning and executing dredging and maritime infrastructure projects.

Since the United Nations formalised the Ecosystem Services approach in 2005, this concept has gained momentum. Balancing the elements of the eco-social system is of importance to the dredging industry and influences the way in projects are valued by stakeholders and managed by clients and contractors.

AWARENESS
Other developments in the dredging industry include increased actions for Sustainability and Safety programmes. The major dredging contractors have developed their own Corporate Social Responsibility action plans. The attention to company-driven Safety plans has resulted in heightened awareness amongst all industry employees and a reduction in lost time injury (LTI) rates. The IADC plans to investigate a harmonisation of safety standards for the industry.

SUSTAINABILITY
In line with other modern industries, all the major dredging contractors have developed programmes which reflect their commitment to sustainable development as well as their concern with the areas in the world where their work is executed.

Structural programmes, in which contributions are made to local populations, range from ensuring clean drinking water and providing housing for local employees in emerging nations to respecting the opinions of stakeholders whose environmental concerns may be the greatest priority. As part of these CSR policies, some companies publish separate annual CSR reports. These actions have mitigated resistance to projects and provided sound solutions that meet both the social and economic needs of a particular community.

SAFETY
One of the highest priorities on every dredging project is to ensure the safety of all personnel. The major dredging contractors are in compliance with international regulations and industry standards expressed in various ISO certificates and OSHA regulations (US). Since dredging companies work with heavy machinery that require skilled workers, most major contractors have developed safety training programmes in-house. Besides regulations for PPE and other standards, safety is emphasized as a personal responsibility for each and every employee from top management to dredging crews. In some cases, outside professionals have been brought in to establish, train and supervise the implementation of these safety systems. All these efforts have resulted in a substantial decrease of Lost Time Injuries (LTI’s) between 2008 and 2012. Within some of the IADC member companies, a reduction of over 50% has taken place.
DREDGING IN FIGURES 2012

DEVELOPMENTS OF DRIVERS
The GDP (Gross Domestic Product) graph shows steady growth after the downturn of 2009 (-3.1%). In 2010 this was +4.9% (adjusted from last year’s document where +4.3% was reported); in 2011 it was +3.8% and in 2012, +3.5% per capita.

WORLD TRADE
As mentioned above, container ships are getting larger, putting increased demand on the capacity and efficiency of ports. Dredging solutions support ports in meeting this challenge by building new ports and hinterland infrastructure, maintaining and deepening existing channels and ports as well as supplying dredged material for extending berths and quay walls. Between 2000 and 2008 waterborne trade increased with 37.2%. In 2009, however, as a result of the global economic downturn, waterborne trade fell with 4.5%. It picked up again rather quickly: in 2010 waterborne trade showed a growth of +7% as compared to 2009, of +4% between 2010 and 2011 and of +5.9% from 2011 to 2012. Overall, in the period 2000 to 2012, the turnover in capital and maintenance dredging for ports and harbours grew from €2,000 mln to €6,680 mln, with a growth of more than €550 mln in 2012. According to Lloyd’s Register, based on today’s rate of growth, waterborne trade will double by 2030.

DEMOGRAPHY AND CLIMATE, URBAN DEVELOPMENT AND COASTAL DEFENCE
According to the United Nations, the world population is growing, especially in coastal zones and specifically in urban areas. The UN predicts that in the next two decades the world’s urban populations will continue to grow by 195,000 a day. At present, eight out of the ten largest cities in the world are located along a coast. The demographics in these urban areas will demand more residential, recreational and industrial land areas. This increases the economic value of coastal areas which will therefore need increased protection against sea level rise caused by climate change. Recent flooding in Western Europe caused by
extreme precipitation (rain and snow) as well as hurricane activity at the end of 2012 in the New York/New Jersey Metropolitan area demonstrate the economic and social vulnerability of major urban areas. In other regions extreme drought and the decrease of river depths are causing problems for navigation and capacity limitations for inland water transportation of goods. Climate changes which influence urban development will remain a strong driver for the dredging industry.

ENERGY
Whilst the search for alternative fuel sources continues, fossil fuels still dominate the global energy arena. More and more of these resources are being exploited offshore, often in remote areas at great depths. Dredging is therefore needed to prepare the seabed and dig trenches for pipelines, and then protect these pipelines by backfilling with sand, gravel and rock. This includes a strong increase in the demand for liquefied natural gas (LNG), which necessitates new port infrastructures, thus generating a maritime infrastructure demand of its own. On the sustainable side, more and more wind farms are being placed at sea. High fuel prices continue to encourage the expansion of the energy supply, also from non-conventional sources, for instance, the “shale revolution” for gas and oil. From 2011 to 2030 production and demand for shale gas and oil are expected to increase.

World primary energy consumption is projected to grow by 1.6% p.a. from 2011 to 2030, adding 36% to global consumption by 2030. The growth rate however declines from 2.5% p.a. for 2000-10, to 2.1% p.a. for 2010-20, and 1.3% p.a. from 2020 to 2030 (BP Energy Outlook 2030, January 2013).
TOURISM AND LEISURE
After a sharp decrease in 2009, reflecting the economic downturn, international tourism showed growth in 2010 and 2011. Estimated dredging turnover in 2012 remained stable compared with 2011.
For the dredging industry the focus is especially on the growth of water-related tourism – beaches, marinas and cruise terminals, water theme parks and resorts. Dredging for recreation and tourist attractions has often been a spin-off of coastal defence activities such as beach replenishments and urban developments.
The number of tourists is predicted to increase to 1.5 billion by 2020.

THE GROWTH OF DREDGING TURNOVER
The drivers of dredging have developed favourably for more than a decade at a moderate, but steady pace. This is true of the dredging industry as well. This moderate, favourable growth has depended on several factors:
• Technological innovation has led to improved cost efficiency and a wider range of projects: The size and capacity of modern dredging vessels has grown resulting in economies of scale. The newest fleets can dig to greater depths and transport sand from remote borrow areas at greater distances and faster speeds. The dredging industry continues to invest in the development of more fuel-efficient ships, equipped with state-of-the-art technology and high-tech systems. These advances make complex projects more financially feasible.
• Engineering and environmental R&D produced by a highly skilled workforce has allowed the industry to make a greater design contribution to large-scale projects. Clients are benefiting from the early involvement of the major dredging companies whose expertise has created new markets and contributed to sustainable solutions.
• In addition, in 2012 the turnover in China rose because of the change in the currency rates of the renminbi (CN¥) toward the euro even though the size of the dredging market has remained similar to previous years.
TURNOVER OF THE GLOBAL DREDGING MARKET 2012

The estimated total turnover of global dredging contractors – private as well as state- or port-owned companies – is estimated at €11,370 mln for 2012\(^1\). The pie chart shows the composition of this turnover for 2012 per driver.

From 2000 to the present, the global dredging turnover has more than doubled. Not all regional markets, however, have developed at the same pace, as is illustrated in the figure below.

The volume of dredging turnover closed to international tenders is still substantial, with China as number 1 and the USA as number 2. In China, a few projects are open for international tenders. The USA market is effectively closed to foreign competition by the Jones Act, which makes it impossible for non-USA owned and controlled contractors to undertake dredging activities. In India, state-owned Dredging Company of India (DCI) has a preferred position in public tendering, although upon occasion foreign companies have been awarded large dredging contracts. Globally, the market share of these closed markets was 46% in 2012. This is an increase of 3% compared with 2011. As mentioned above, this increase resulted from a change in exchange rates between the renminbi and the euro.

When considering the entire dredging market, the market share of IADC members (private contractors) was 49% in 2012. This is a decrease of 2% compared with 2011. When considering only open markets with free access, IADC members represented a total of 90% market share in 2012, a clear increase since 2000 (2000 = 75%).

\(^1\) This figure relates to underwater excavation, transportation and placement of dredged material carried out in 2012. It does not include maritime construction such as breakwaters, offshore installations, harbour infrastructure, dams, dikes and other infrastructure in which dredging contractors are involved. However, within this figure, some €350 mln relate to rock works that are an integrated part of land reclamations and coastal defence.
DEFINITIONS AND METHODOLOGY

This review relates to the annual turnover estimated for 2012. ‘Carried out in 2012’ therefore does not necessarily mean ‘contract awarded in 2012’, nor that payment was received in 2012. It only reflects work that was actually performed in 2012. For projects only partially performed in 2012 (e.g., a project started on 1-1-2011 and finalised on 30-6-2012), the value of the part actually executed in 2012 has been attributed.

Dredging projects in inland waterways – as far as known – are included in the survey as well as stone protection works for quay walls and coastal protection. Also not included are stone dumping through flexible fall pipe vessels (FFPV) vessels and side-stone dumpers. Specific land-based ‘dry’ engineering works are also excluded. Environmental measures and remedial dredging, however, are included.

TYPES OF PROJECTS

Trade:
• harbour extensions (excluding offshore crude oil terminals and LNG terminals [see Energy] and excluding marinas and cruise terminals [see Tourism])
• navigation channels and turn basins
• maintenance dredging

Coastal defence:
• beach nourishment and replenishment
• dike building/raising and flood defence works (excluding civil works)
• coastal protection, river training and other shore protection measures

Urban development:
• land reclamation for, e.g.:
  • industrial infrastructure portion, industrial, trade and service, recreational, transport infrastructure and for urban development (coastal expansion)
  • trade and service infrastructure (trade fairs, business parks, conference centres)
  • transport infrastructure (airports, roads, parking facilities, rail projects)
  • residential real estate (housing driven by demographic pressure)
  • dredging trenches for immersed tunnels, dams
  • outfalls and landfalls
  • marine storage basins for contaminated dredged materials

Energy:
• dredging for offshore crude oil terminals and LNG terminals
• trenching and backfilling for sub-marine cables and pipelines
• (pre)dredging related to oil drilling facilities (e.g., platforms, glory holes)
• other offshore installations (gravity-based structures for wind farms)

Tourism:
• land reclamation for recreation sites such as theme parks, recreation piers/wharfs, shopping malls) and marinas and cruise terminals, land reclamation for hotels, holiday resorts
• beach restoration and replenishment

METHODOLOGY

Dredging in Figures has been carefully compiled by a Delphi survey amongst IADC members, analyses of company reports and other (public) sources. All information has been verified to the best of our ability, however, the IADC and its members cannot be held responsible for any inaccuracies. The review does not necessarily reflect the opinions of individual IADC members. Please contact the IADC if you wish to reproduce any or all information in this review either electronically and/or in any other form.

For further enquiries, please contact the IADC Secretariat:
T +31(0)70 352 33 34
E info@iadc-dredging.com
W www.iadc-dredging.com

The International Association of Dredging Companies (IADC) is the global umbrella organisation for contractors in the private dredging industry. As such the IADC is dedicated to promoting not only the skills, integrity and reliability of its members, but also the dredging industry in general. The information presented here is part of an on-going effort to communicate with clients, stakeholders and other concerned parties about the fundamental importance of dredging and maritime construction.