DREDGING IN FIGURES 2016

INTERNATIONAL ASSOCIATION OF DREDGING COMPANIES
IADC presents its annual review of the global dredging market ‘Dredging in Figures’, with a focus on the international dredging industry’s revenue for 2016. The information presented in this edition is a representation of the open markets as data from closed markets cannot be verified in its entirety. IADC aims to be thorough and precise in the figures introduced in this document, by generating statistics from information provided by public sources as well as IADC member companies.

MARITIME SOLUTIONS FOR A CHANGING WORLD
Seven years since the world economy emerged from its deepest recession, economies are experiencing fluctuating improvement across the globe. In line with a pre-2016 forecast by the International Monetary Fund (IMF), global economic growth during 2016 was recorded as 3.1%. In advanced economies, unemployment levels are diminishing. Emerging markets and developing economies presented an unexpected and incidental slowdown according to the IMF. The effects of executed infrastructure projects such as the expanded Panama Canal and Suez Canal can influence seaborne trade, from restructuring world shipping networks to generating business opportunities. As the tourism sector continues its upward trend, concerns related to terrorism led to conscious locational substitutions, negatively impacting some regions. A slow rise in oil prices has improved the outlook of some countries while fluctuating currency exchange rates have influenced global commodity prices.

Despite the limited growth in the world’s economy, the dredging industry’s turnover – excluding closed markets – in 2016 was estimated at €5.02 billion in comparison to €7.115 billion in 2015. The preceding year’s elevated figure results from the expedited realisation of the Suez Canal expansion project which added a €1.1 billion surplus to 2015’s revenue. This paper highlights essential information about the dredging industry, which is divided into three sections – Corporate Social Responsibility (CSR) that includes sustainability, emissions, safety; the drivers of the dredging industry; and the turnover in the open markets of the industry.

CORPORATE SOCIAL RESPONSIBILITY
Through Corporate Social Responsibility (CSR) activities, companies aim to assume responsibility for their actions and towards the environment, consumers, employees, communities and other stakeholders. CSR efforts of major dredging companies include programmes for sustainability, community involvement, fuel emissions reductions, in-house safety programmes and extended education for employees.

SUSTAINABILITY
Sustainable development is a major aspect of the CSR strategies within major dredging companies. Companies view environmental issues as a serious matter and realise projects and dredging activities in compliance with their environmental policies and goals. Dredging contractors are considering biofuel alternatives, utilising biodegradable lubricants, reducing carbon emissions and implementing vessel recycling policies for controlled and monitored ship dismantling. The industry is voluntarily circulating information to the public regarding the positive or negative effects of dredging in areas where projects are being undertaken. These activities are putting the concept of ecosystem services (ES) into practice.

A framework which has existed for decades but has come to the fore in recent years, ES contributes to the efficient implementation and realisation of sustainable dredging and marine infrastructure works in environmentally sensitive areas. The framework serves as an important tool for the integral evaluation of a project’s positive and negative impacts to aid in achieving broad public support. Recognising the importance of the concept and its role in bringing an overall acceptance to dredging projects, IADC released the publication Ecosystem services: Towards integrated marine infrastructure project optimisation.

EMISSIONS
The dredging industry is committed to reducing its CO₂, SO₂ and NOₓ emissions, especially since a majority of its carbon footprint results from fuel consumption during dredging works. Companies measure their energy consumption
and are committed to reducing fuel usage. Alternative fuels are being tested and used such as liquefied natural gas (LNG) and biofuels. By reducing fuel consumption, cost efficiency is improved and therefore benefits contractors and clients. For further information about emissions legislation and their impact on the European dredging market, refer to the European Dredging Association’s (EuDA) information paper from 2013 which focuses on ways to reduce SO\textsubscript{2} emissions into marine environments from dredging vessels.

SAFETY
As one of the dredging industry’s highest priorities, safety is ensured by maintaining procedures and awareness which protect employees and crew on the job. A company’s performance is most efficient when daily operations can run smoothly without incidents. Major dredging companies are in compliance with international and industry regulations as delineated in various ISO standards. A majority of companies have created in-house safety training programmes for its workers, where safety is emphasised as the responsibility of each individual. Contractors are actively cultivating a safety-oriented culture by increasing awareness by identifying processes and situations where employees may encounter risks.

IADC plays an active role in promoting safety awareness within the industry. By forming a Safety Committee, best practices can be clearly and effectively communicated amongst its members. The creation of a ‘Safety Charter’ demonstrates its members are committed to ensuring a safe and healthy working environment for their employees as well as their compliance with all applicable safety and health laws, relevant regulations and codes of practice where they operate. IADC members are dedicated to eliminating risks to its personnel, equipment and the environment wherever possible and committed to stimulating a culture of safety awareness with continuous improvement. Initiated by the committee, the IADC Safety Award aims to encourage the further development of safety skills on the job and rewards people and companies who make it possible to work safer. In addition, the award is aimed at promoting those who demonstrate special diligence in safety awareness in performing their profession. IADC endorses nominated and winning safety-oriented innovations by featuring articles on the topic in its quarterly journal *Terra et Aqua*. 
WHAT DRIVES DREDGING?
Six drivers are key to charting progress in the dredging industry: world trade, population growth (demographics and urban development), coastal protection, growing demands for energy, water-related tourism, and environment.

WORLD TRADE
With goods primarily transported via sea routes at an increasing rate, world trade is a major driver for the dredging industry. Ports are essential to the distribution of goods from seaborne trade, therefore they should be maintained to ensure optimal trading levels are sustained. Development and maintenance of ports and waterways is performed by dredging companies. With seaborne trade accounting for the bulk of world trade, there is an omnipresent need to expand existing ports and construct new ports and waterways.

According to the Organisation for Economic Co-operation and Development (OECD), numerous ports across the globe need to improve their capacities in order to handle future trade growth as well as growing container ship sizes. Studies from the World Trade Organization show a low level of trade growth in 2016.

The decline was partially driven by a weak GDP growth of just 2.3%, which is down from 2.7% in 2015 and well below the 2.8% average annual rate since 1980. With a 1.3% increase in 2016, world merchandise trade recorded its lowest growth in terms of volume since the financial crisis of 2008. This is half the level achieved in 2015 and well below the 4.7% average annual growth rate since 1980. Imports of developed economies grew 2.0% while those of developing economies stagnated, and exports recorded modest growth of 1.4% in developed economies and 1.3% in developing economies.

Global regions were affected to varying degrees by the slump in trade in 2016 but by the concluding quarter of the year, container throughput of major ports showed a trend of recovery from the preceding two-year-long slump. World exports of freight transport by sea declined by 13% due to overcapacity in the shipping industry and weak demand as a result of stagnating economic conditions. Slower growth in trade resulted in less port and waterway-related investments.

Completed in 2015, the Suez Canal expansion was the largest project at the canal since its

CONTAINER TRAFFIC (BY SEA) AND PLANNED CAPACITY BY 2030

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Container traffic by sea and estimated ship capacity is expected to grow from 2013-2030. (Source: Capacity to Grow, OECD)
Construction, adding a new shipping lane to double the waterway’s transit capacity and in 2016, the Panama Canal expansion project opened for traffic. Both infrastructure developments have since welcomed mega-vessels, improving trade connectivity and access to suppliers and consumers. Still underway, China’s Belt and Road Initiative and Japan and Asian Development Bank’s Partnership for Quality Infrastructure aim to stimulate trade and demand for transport and logistics services. In combination with trade policy developments, population growth and urbanisation, and increasing prevalence of e-commerce, these initiatives have the potential to grow merchandise trade and overall seaborne trade volumes, generating opportunities for developing countries as both users and providers of maritime transport services.

DEMOGRAPHICS AND URBAN DEVELOPMENT

As population growth places pressure on countries with limited space as a result of urbanisation, the ability to expand their buildable land area can alleviate this problem. This need has made land reclamation a major driver for the dredging industry. Contractors regularly execute land reclamation projects around the world, broadening the boundaries of existing coastal areas or islands. World population continues to steadily grow, having reached 7.5 billion people in July 2016 according to the UN Department of Economic and Social Affairs (UN DESA). UN DESA predicts that the upper limits of world population may reach 8.7 billion in 2030, 10.2 billion in 2050 and 13.2 billion in 2100. To keep up with the increase in population, countries must continue urban development.

According to The World’s Cities in 2016 report by the UN, 54.5% of the world’s population is estimated to live in urban areas. The UN predicts that by 2030, 60% of the world’s population will reside in urban areas and one of every three people will live in cities of at least half a million inhabitants. Currently, 22% of the world’s population (1.7 billion people) live in a city with at least 1 million inhabitants and this is projected to increase to 28% by 2030. City sizes are projected to grow as well as the prevalence of mega-cities which each have populations over 10 million inhabitants. There are 39 megacities across the world – with most of the urban cities in flood risk areas – and this total is projected to rise to 41 by 2030 (see figures). With such an increase in population growth occurring specifically in cities, the dilemma of land scarcity can be resolved with reclamation, adding space where it is needed, as most urban cities are located along coastlines across the world.
COASTAL PROTECTION

Many coastal countries must regularly maintain the integrity of their dynamic shorelines. Dredging companies aid in the process by undertaking coastal protection projects and maintaining shorelines by means of beach nourishment. The side effects of climate change – more extreme weather events and rising sea levels – have a direct consequence for increasingly inhabited waterfront or low-lying cities and areas such as an elevated potential for flood risks, especially resulting from natural disasters. It is projected more than half of the world’s population will reside within 100 kilometres of a coast by 2030.

For many countries, a majority of their inhabitants live in flood-prone areas with OECD approximating floods currently affect 250 million people around the world every year. For example, two-thirds of the Netherlands’ inhabitants live in flood-prone areas and nearly half of Japan’s population resides in former river and coastal flood plains. In Asia, the mega-cities of Ho Chi Minh City, Jakarta and Manila already suffer from flooding events regularly. Since 1980, the United States experienced 212 events which individually generated damages amounting to over US$1 billion (cost-adjusted to the 2017 Consumer Price Index) for a total of US$1.2 trillion.

Annual average damages from floods reported by the international disasters database (EM-DAT) have increased over the decades, from less than US$4 billion per year between 1971-1980 to over US$40 billion per year between 2011 and 2015 (see figure).

Large flood events have clear financial and economic implications for government, business and households as well as indirect impacts of business interruption, employment losses and decreased tax revenues. Agricultural output and tourism revenue may be reduced in the aftermath until recovery efforts are implemented. For example, the 2011 floods in Thailand resulted in tourism revenue losses of US$3 billion (World Bank and Thai Ministry of Finance, 2012) and Hurricane Sandy led to New York City’s estimated tax revenue losses of US$160 million from reduced business revenue and wages (New York City Recovery, 2015). Coastal cities must respond to nature’s call by improving their flood management capabilities through coastal protection strategies. Dredging contractors have performed coastal protection projects across the world for decades, gaining experience and specialised knowledge in the sector, leading to innovative solutions for future works.

Annual average damages from flood events have increased over the past four decades – 1971-2015. (Source: Financial Management of Flood Risk, OECD)
ENERGY

The energy sector is a driver for the dredging industry for the construction of offshore oil, gas and wind infrastructure. The oil and gas sector is exploiting resources offshore and in remote areas, often requiring dredging for the realisation of these projects. Dredging activities include trenching, backfilling trenches and seabed preparation for offshore installation purposes. As reported by the International Energy Agency (IEA), investments in global energy have declined for two consecutive years and by 12% in 2016 alone, although it marked the first year electricity investments exceeded fossil fuels, thanks to a 9% increase. Although the price has rebounded in 2016, the oil price drop of 2015 impacted the oil and gas industry – which is representing two-fifths of the global energy market – by delaying projects and in turn dredging activities, extending the duration of recovery.

While renewable energy investments reduced by 3%, it remained the largest area of electricity spending at US$297 billion according to IEA. Hydropower represents a steady 60% of the renewables category, but infrastructure projects for wind and solar photovoltaic has grown each year. In particular, offshore wind energy is a driver for the dredging industry as contractors execute seabed preparation for the foundations of wind turbines. WindEurope reports investment in the offshore wind industry in Europe has grown at an annual average of 30% in the last five years and according to Bloomberg, the price of building an offshore wind farm has fallen 46% during the same period. Larger turbines with an expected reduction in installation costs are making offshore wind a competitive alternative to land-based turbines and solar and nuclear power.
TOURISM AND LEISURE

Tourists continue to frequent beaches and waterfront cities. According to the World Travel Monitor®, sun and beach holidays increased by 6% in the first eight months of 2016. From 2007 to 2014, cruise holidays surged 248% and have continued to rise, along with the prevalence of cruise ships and yacht harbours which attract and accommodate the additional tourists. Beach-oriented tourism draws visitors to sandy shorelines which then experience accelerated rates of erosion. As a result, dredging contractors are regularly tasked with beach replenishment projects.
TURNOVER IN DREDGING

The total turnover of dredging contractors in the open markets was estimated at €5.02 billion for 2016, with approximately 10% of this turnover resulting from rockworks. This represents a decrease of 30% compared to the €7.115 billion turnover in 2015, however, a large share of 2015’s turnover resulted from the expedited realisation of the Suez Canal project (€1.1 billion). This was an extraordinary project that was executed in an extremely short period and influenced the general picture of the industry. Without the Suez Canal project, the global turnover in the open markets during 2015 would have been around €6 billion, shrinking the revenue gap to 16% for an accurate reflection of both slowed market conditions and dredging companies’ revenues in 2016. Figures exclude turnover from projects which were not available for international tendering in open markets. Since the global dredging market does not benefit from international competition in closed markets – for example China and the United States – the IADC will not publish revenue information as the data cannot be verified.
DREDGING IN FIGURES 2016

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International Monetary Fund. (January 2017). World Economic Outlook Update.


Maritime Executive. (March/April, 2016). The Case for Wind.

Maritime Executive. (March/April, 2016). Is There Light At the End of the Oil Price Tunnel?


DEFINITIONS AND METHODOLOGY
This review relates to the annual global dredging turnover estimated for 2016. ‘Carried out in 2016’ therefore does not necessarily mean ‘contract awarded in 2016’, nor that payment was received in 2016. It only reflects work that was actually performed in 2016. For projects only partially performed in 2016 (e.g., a project started on 1-6-2015 and finalised on 30-6-2016), the value of the part actually executed in 2016 has been attributed. Dredging projects in inland waterways – as far as known – are excluded in the survey as is rock installation through flexible fall pipe vessels (FFPV) and side-stone dumpers. Specific land-based ‘dry’ engineering works are also excluded. Stone protection works for quay walls and coastal protection are included as well as environmental measures and remedial dredging.

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 port, 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 such as production platforms
- other offshore installations (seabed preparation for the installation of gravity-based structures for wind farms)

Tourism
- land reclamation for recreation sites such recreation piers/wharfs, shopping malls) and marinas and cruise terminals, land reclamation for hotels, holiday resorts
- beach restoration and replenishment
DREDGING IN FIGURES 2016

REGIONS

Africa
Continent from North Africa Coast, Atlantic Coast and Indian Coast up to and including Suez Canal, Madagascar, La Reunion, Mauritius, Seychelles, Canary Islands, Cape Verde.

North America
Canada, USA (closed market) including Hawaii.

Latin America
From Mexico southwards, including Caribbean States.

Europe
Europe, Turkey, Coast of Black Sea, Western Russia (west of river Ob).

Middle East
Near East south of Turkey, Georgia, Armenia, Azerbaijan, including Israel, Arabian Peninsula, Persian Gulf and Iran.

Indian Subcontinent
India, Bangladesh, Sri Lanka, Maldives, Pakistan.

Asia
Including Eastern Russia (east of river Ob), South East Asia, Far East, including Taiwan, excluding China.

China (closed market)
PR of China including Hong Kong and Macao.

Oceania
Australia, New Zealand and Pacific Islands.

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 IADC’s ability. IADC and its members cannot be held accountable for any inaccuracies. The review does not necessarily reflect the opinions of the individual IADC members.

Please contact IADC if you wish to reproduce any or all information in this review either electronically and/or in any other form.

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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.