Dredging in Figures is an annual review of the global dredging market. The document focuses on the global dredging and maritime construction industry in 2014. The IADC aims to be thorough and precise in the figures presented in this document. The data of the closed markets could not be verified in its entirety. For this reason the information has been restricted to the open markets. The statistics provided here are based on information from international sources as well as from IADC member companies.

MARITIME SOLUTIONS FOR A CHANGING WORLD
Over the past two years, the global economy has been gradually recovering. What were just signs of recovery in 2013 became steady in 2014 through the improvement of world markets (modest growth for both advanced and emerging economies), a drop in unemployment rates and an increase in investments. The worldwide dredging turnover remained stable in 2014 at € 6.415 billion (excluding the closed markets) compared to 2013 which was € 6.370 billion.

This paper also highlights essential information about the dredging industry, which is divided into three sections – Corporate Social Responsibility (CSR) that includes sustainability, reduction of emissions, safety and personnel training; the drivers of the dredging industry; and the turnover of the industry.

CORPORATE SOCIAL RESPONSIBILITY
Through CSR activities companies aim to assume responsibility for their actions and encourage positive activities toward the environment, consumers, employees, communities and stakeholders in general. The CSR efforts of the major dredging companies include programmes for sustainability, contributions to communities in areas where dredging works are taking place, emissions reductions, in-house safety programmes and extended education for employees.

SUSTAINABILITY
Sustainable development forms a main part of the CSR strategies of the major dredging companies. These organisations have put in place plans to achieve their sustainability goals. For a sustainable environment, contractors are testing biofuels, utilising biodegradable lubricants, reducing carbon emissions and have vessel recycling policies for controlled and monitored ship dismantling.

EMISSIONS
Many IADC dredging companies are keen on reducing CO₂ emissions, especially since most of their carbon footprint is a result of fuel consumption during dredging works. These companies are measuring their energy consumption and are committed to fuel reduction by testing alternative fuels like LNG and biofuels for instance. Ultimately, fuel consumption reduction can contribute to cost efficiency for the contractors.

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. Since dredging companies work with heavy machinery that require skilled workers, most contractors have developed in-house safety training programmes. Besides regulations for Personal Protective Equipment (PPE) and other standards, safety is emphasised as a personal responsibility for each and every employee from top management to dredging
crews. The implementation of tailor-made safety programmes amongst the major companies have resulted in heightened awareness and a reduction in lost time injury (LTI) rates. The development of the LTI index within the IADC member companies is shown in the graph below. It is a clear reflection of the performance of the industry as a whole that individual companies have taken the initiative to institute safety methods which apply to their specific situations.

As shown by the graph below, strict safety standards and programmes have resulted in a continuous decline of LTI rates among the dredging contractors.

**DEVELOPMENT LTI-INDEX IADC MEMBERS, 2009 = 100**

(Source: IADC)
WHAT DRIVES DREDGING?
The industry recognises six drivers of dredging: world trade, population growth (demographics and urbanisation), coastal protection (as a result of climate change and increasing sea levels), growing demands for energy, water-related tourism, and environment.

WORLD TRADE
Seaborne world trade is the most important driver for the dredging industry. According to the International Monetary Fund (IMF), global world trade is projected at 3.3% in 2015, slightly lower than in 2014 but with a gradual increase in advanced economies and a slowdown in emerging market and developing countries.

According to the World Economic Outlook July 2015 update, growth in advanced economies was 1.8% in 2014 and is predicted to increase gradually in 2015 (2.1%) and 2016 (2.4%). Emerging markets and developing economies did better with a 4.6% growth (a drop from 5.0% in 2013) but the World Trade Organisation (WTO) expects this growth to dip to 4.2% in 2015.

Seaborne trade, GDP and merchandise trade are interlinked. In fact, around 80% of global trade by volume and over 70% of global trade by value is carried by sea and handled by ports worldwide. According to figures released by Clarksons Research (Seaborne Trade - Basket Case For a Monthly Shop, 2015), 2014 saw an increase in seaborne trade compared to 2013. The total tonnage covered by seaborne trade amounted to 5.8 billion tonnes in 2014.

China has added to the global seaborne trade at a tremendous level. According to Clarksons Research’s figures, between 2002 and 2014, four billion tonnes were added to global seaborne trade. However, Chinese imports accounted for 94% increase in iron ore volumes, 35% of expansion in coal volumes and growth in crude oil trade.

With seaborne trade accounting for the bulk of world trade, the expansion and building of new ports cannot be underestimated. The Panama Canal Expansion is the largest project at the Canal since its construction – it is meant to create a new shipping lane along the Canal and double the waterway’s capacity. The existing locks allow the passage of vessels that can carry up to 5,000 twenty-foot equivalent units (TEUs). After the expansion, vessels will be able to transit through the Canal, with up to 13,000 TEUs.

The New Suez Canal has been expanded in 2015 allowing the transit of ships in both directions over much of the canal’s length. It is expected that this will double the daily transit capacity from 49 to 97 ships.

Container ships are also getting larger and putting demand on capacity and increased efficiency of ports. In 2014, some of the largest container ships (CSCL Globe and CSCL Pacific Ocean) with over 19,000 TEU capacities were added to the global fleets.
DEMOGRAPHICS AND URBAN DEVELOPMENT

Population growth across the globe has increased the pressure on various factors – housing, industrial areas and recreation. According to the UN Department of Economic and Social Affairs (UN DESA), the current world population of 7.3 billion is expected to reach 8.5 billion by 2030 and to reach 9.7 billion by 2050. The need for more land has increased the need for reclamation, which is a major driver for dredging. Dredging projects can include building new land adjacent to existing urban areas or islands near the coast.

The Environment can be recognised as a separate driver but most often is part of one of the other drivers. Remediation of contaminated sediments at historically contaminated industrial sites, i.e., areas where heavy industries were formerly (or still) located, are primarily initiated as part of a larger project. Restoration of habitats is almost always part of a larger project and thus the turnover is based on one of the other drivers. In the case of dedicated remediation projects, the dredging turnover can be a relatively small part of the overall remediation costs. For these reasons the turnover related to environment is difficult to determine and as such, not shown in the table on page 7.

The World Urbanization Prospects: The 2014 Revision report states that 54% of the world’s population is living in urban areas. With the overall increase in world population, another 2.5 billion people is projected to be added to urban populations by 2050, especially with close to 90% of the increase concentrated mainly in Asia and Africa. Currently, Asia is home to 53% of the world’s urban population followed by Europe at 14% and the Caribbean at 13%. As such, a substantial shortage of land is already apparent.

The largest proportion of these new city dwellers will live in vulnerable floodplains and estimates indicate that by 2050, half the world’s population will be living within 100 kilometres from a coast (Adger et al., 2005).
COASTAL PROTECTION

Coastal protection has grown in importance as a result of climate change and more extreme weather circumstances. This along with consequent sea-level rise has been a leading cause of increased attention to the need for coastal and inland protection against flooding. The industry has the knowledge, innovative solutions and capacity to address these challenges and continues to invest in research to this end.

The impact of flood-related events cannot be underestimated and annual economic losses can come up to staggering figures in coastal or port cities. A study conducted for the OECD (S. Hallegatte et al., 2013) across 136 ports across the world, stated that average global flood losses could be estimated at about US$6 billion per year (based on 2005 data). This could increase to US$52 billion by 2050 with projected socio-economic changes. The paper also pointed out that many flood defences have been designed for past conditions, and even a moderate rise in sea level could lead to soaring losses. Estimated figures show that losses could be in excess of US$1 trillion. Thus, coastal cities have to improve their flood management, including better defences, at a cost estimated around US$50 billion per year for the 136 cities.

ENERGY

Population growth and increases in income per person are the key drivers in the growing demand for energy states the BP Energy Outlook 2035 report. The energy sector is a major driver for the dredging industry given the fact that increasingly resources are being exploited offshore, often in remote regions and at great depths. In terms of the natural gas and offshore oil sectors, major dredging companies provide specialised services for offshore oil and gas projects that include trenching and backfilling, pulling and laying of shallow-water pipelines. Offshore oil and liquefied natural gas (LNG) production necessitates port infrastructures, thus generating a maritime infrastructure demand of its own.

Although the supply of wind energy and other renewables has increased, fossil fuels are still the major source of energy across the world. According to the International Energy Agency (IEA), the share of fossils fuels in total global energy is expected to decline to around 75% in 2035 from the current 82% (IEA, 2015), but this nonetheless involves an increase in the world’s annual consumption of fossil fuels by around 2,300 million tons of oil equivalent (Mtoe), over today’s levels.

LOCATION OF THE 136 PORT CITIES

(Source: Nicholls et al., 2013)
In Europe, renewables has seen a growth despite the low oil prices. The European Union (EU) – through the Renewable Energy Directive – aims to have at least 20% of its total energy needs and 10% of its transport fuels met with renewables by 2020. A substantial part of renewables consist of wind energy, which is very relevant to the dredging industry as contractors execute seabed preparation for the foundations of windmills.

**TOURISM AND LEISURE**

The tourism industry has grown steadily within the past decades and that includes tourism along coastlines and beaches; cruise ships and yacht harbours also continue to attract tourists. Though beach tourism pulls a great crowd across the globe, many of the beaches are affected by weather-related events and erosion. For these reasons replenishment of beaches by dredging is executed on a regular basis and is consequently appropriated for in long-term budgets. The dredging turnover related to tourism and leisure remained stable at 3% from 2013 to 2014.

**TURNOVER IN DREDGING**

The total turnover of dredging contractors, private and state- or port-owned companies in the open markets was estimated at € 6.415 billion for 2014. This is a slight increase of 0.7% compared to the 2013 turnover of € 6.370 billion.

The share of the market closed to international players is believed to be substantial, with China leading followed by the US. In China, only a few projects are open for international tenders. The US market remains closed to foreign competition by the Jones Act, which makes it impossible for non-US 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, frequently for the private sector.
DREDGING IN FIGURES 2014

REFERENCES


DEFINITIONS AND METHODOLOGY
This review relates to the annual global dredging turnover estimated for 2014. ‘Carried out in 2014’ therefore does not necessarily mean ‘contract awarded in 2014’, nor that payment was received in 2014. It only reflects work that was actually performed in 2014. For projects only partially performed in 2014 (e.g., a project started on 1-6-2013 and finalised on 30-6-2014), the value of the part actually executed in 2014 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 is 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)

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 (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 2014

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 for any inaccuracies. The review does not necessarily reflect the opinions of the individual IADC members.

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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.