# DREDGING IN FIGURES 2013

IADC

INTERNATIONAL ASSOCIATION OF DREDGING COMPANIES

# DREDGING IN FIGURES 2013

*Dredging in Figures* is an annual review of the global dredging market. The document focusses on the global dredging and maritime construction industry in 2013. The IADC aims to be thorough and precise in the figures presented in this document. The statistics provided here are based on information from international sources as well as from the IADC member companies. This information indicates a growth of the worldwide turnover in dredging of nearly 3%.

## MARITIME SOLUTIONS FOR A CHANGING WORLD

Following a relatively long period of economic downturn, 2013 showed small signs of recovery, whether measured by the growth of consumer trust, investments by companies and world trade or lower unemployment rates. However, even during the downturn, the worldwide dredging turnover showed an increase of 13% between 2008 (€10.3 bln) and 2013 (€11.68 bln). The dredging turnover in 2013 shows an increase of 2.7% compared to 2012.
Last year the IADC started to provide information on so-called Corporate Social Responsibility elements. These will be elaborated in the first part of this document; the second and third parts will deal, respectively, with the drivers of the industry and the turnover of the industry.

## CORPORATE SOCIAL RESPONSIBILITY

CSR activities aim to assume responsibility for the company's 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, including contributions to communities in areas where dredging works are taking place as well as fuel emissions reductions, in-house safety programmes and extended education for employees.

## 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. Examples of this commitment are tests with biofuels, the use of biodegradable lubricants, emissions reduction and controlled and monitored ship dismantling.
Many companies have structural CSR programmes, in which contributions are made to local populations, ranging from ensuring clean drinking water and providing housing for local employees in emerging nations to respecting the opinions of stakeholders whose environmental concerns must be treated as a 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.

## EMISSIONS

Most of the IADC's members have determined their $CO_2$ footprint. It appears that over 90% of the footprint is the result of fuel consumption during the dredging works. The industry has been committed to fuel reduction for several decades, both from the perspective of sustainability and of cost efficiency.

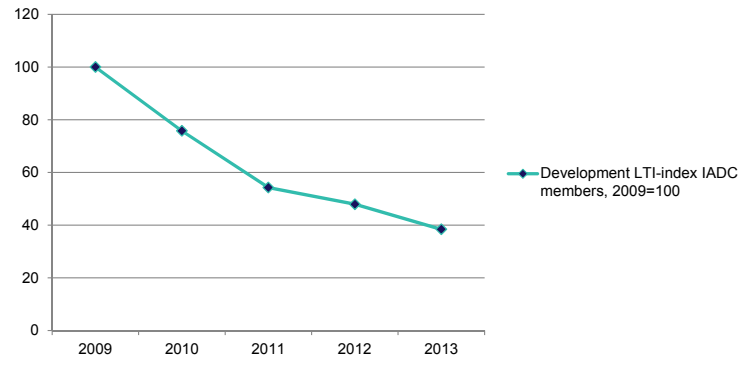
## SAFETY

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 plans amongst the major companies have resulted in heightened awareness and a reduction in lost time injury (LTI) rates. The development of the index of LTI's 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. The IADC has also established a new Safety Committee in which the member companies can share best-practices and learn from each other.

## EDUCATING PERSONNEL

Dredging projects are often executed in remote areas. The operations to achieve a specific result which meets the project requirements is not necessarily known to the public at large and the complexity of the work is often underestimated. Stakeholders are often not aware of the expertise of the highly trained crews and the professional level of the engineers at the dredging companies. In general, over 40% of the employees working for dredging companies have obtained a Bachelors or Masters degree. Companies also invest heavily in in-house training and education as dredging encompasses highly specialised skills and knowledge which is only available within the companies.

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




(Source: IADC)

# DREDGING IN FIGURES 2013

## WHAT DRIVES DREDGING?

The industry recognises 6 drivers of dredging: world trade, population growth (demographics and urbanisation), coastal protection (as a result of climate change and sea level rise), increasing demands for energy, water-related tourism and environment.

## WORLD TRADE

World trade is widely recognised as the most important driver for the dredging industry. According to the International Monetary Fund (IMF) the growth in the advanced economies is projected to strengthen in 2014. Growth in the United States will remain above trend; growth in Japan is expected to be moderate. Growth in emerging and developing Asia is projected to remain robust and to recover somewhat in Latin America and the Caribbean. This will contribute to an increase of world trade. Container ships are getting larger, putting increased demand on the capacity and efficiency of ports. Growing from the previous largest ships of 16,000 TEU capacity, in 2013 six new ships with over 18,000 TEU capacity joined the world's fleets.

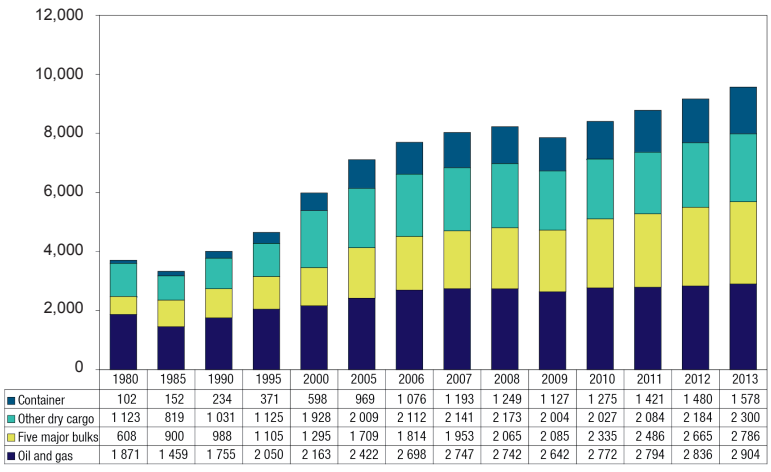
The 'World Trade Report 2013, Factors shaping the future of world trade' shows a substantial growth of the Gross Domestic Product (GDP) in both high and low scenarios. As there is a close relation between seaborne trade and GDP, a growth in seaborne trade can be expected.

## DEMOGRAPHICS AND URBAN DEVELOPMENT

Population growth increases pressure on urban areas and can exacerbate the need for housing, recreation and industrial areas. A major driver of dredging involves land reclamation, building new land adjacent to existing urban areas or islands nearby the coast. In both cases, R&D by the major dredging companies and their investments in new vessels with enormous sand-winning capacities have made this a cost-effective solution for countries to deal with overpopulation. These land reclamations are sometimes confronted with polluted areas and contaminated sediments.

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 tables on page 7 and 8.

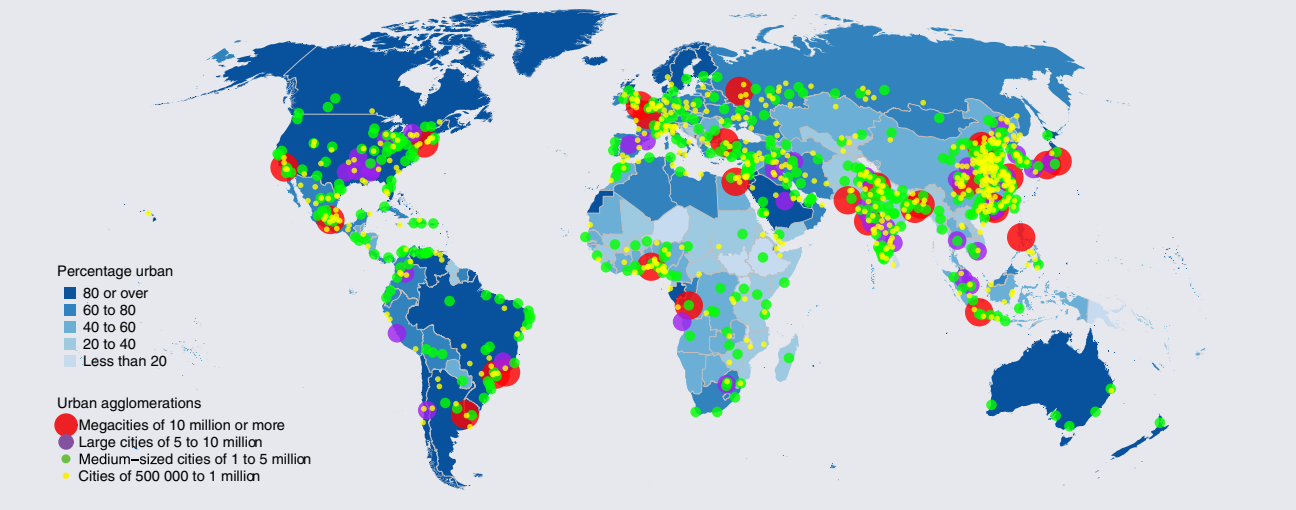
## GLOBAL SEABORNE TRADE 1980-2013 IN MLN TONNES




| | 1980 | 1985 | 1990 | 1995 | 2000 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Container | 102 | 152 | 234 | 371 | 598 | 969 | 1 076 | 1 193 | 1 249 | 1 127 | 1 275 | 1 421 | 1 480 | 1 578 |
| Other dry cargo | 1 123 | 819 | 1 031 | 1 125 | 1 928 | 2 009 | 2 112 | 2 141 | 2 173 | 2 004 | 2 027 | 2 084 | 2 184 | 2 300 |
| Five major bulks | 608 | 900 | 988 | 1 105 | 1 295 | 1 709 | 1 814 | 1 953 | 2 065 | 2 085 | 2 335 | 2 486 | 2 665 | 2 786 |
| Oil and gas | 1 871 | 1 459 | 1 755 | 2 050 | 2 163 | 2 422 | 2 698 | 2 747 | 2 742 | 2 642 | 2 772 | 2 794 | 2 836 | 2 904 |

(Source: UNCTAD, 2014)

## PERCENTAGE URBAN AND LOCATION OF URBAN AGGLOMERATIONS WITH AT LEAST 500,000 INHABITANTS, 2014




(Source: United Nations, World Urbanisation Prospects, 2014)

In a recent study (Roeffen et al, 2013), a substantial shortage of land within 30 years was identified. Urbanised land is likely to double by 2030 in order to accommodate economic development and another 1.5 billion people moving to cities (Seto et al., 2012). At the moment 54% of the world's population is living in urban areas. This percentage has grown since 1950 when it was 30%. Predictions indicate that in 2050 it will be 66%.

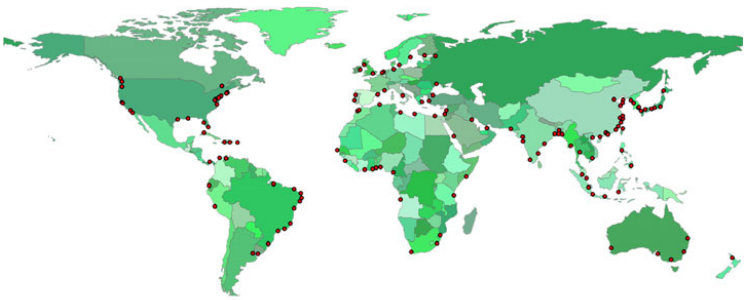
The largest proportion of these new city dwellers will live in vulnerable floodplains and estimates indicate that by 2050 half the world's population will be living within 100 kilometres from a coast (Adger et al, 2005).

### 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.

Annual economic losses from flood-related events were estimated by the researchers (S. Hallegatte et al, 2013) for 136 coastal port cities. Based on 2005 data, they estimated current total losses to be US$6 billion per year. They then forecasted losses for the year 2050, for various future climate change and adaptation scenarios. Based on socio-economic change alone, losses as a result of flooding were estimated to reach US$52 billion by 2050. However, when the effects of climate change and subsidence were accounted for in the calculations, without climate change adaptation measures, this could climb to US$1 trillion. If investments in adaptation could maintain coastal protections at their current levels, losses in 2050 could be limited to US$60-63 billion per year.

## LOCATION OF THE 136 PORT CITIES



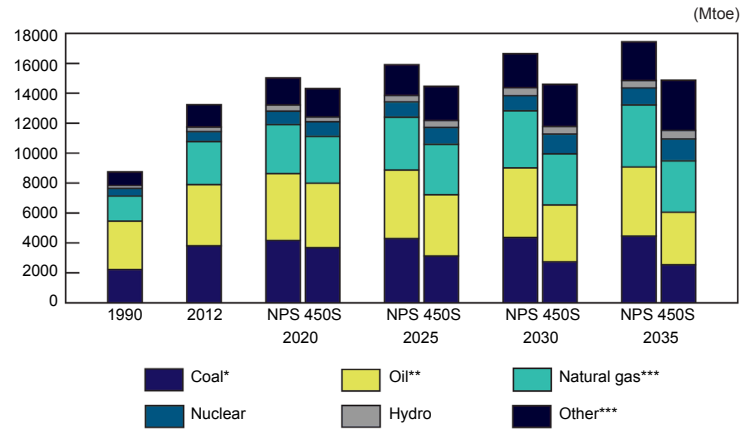
(Source: Nicholls et al, 2008)

# DREDGING IN FIGURES 2013

## ENERGY

Energy demands, despite all kinds of efficiency measures, continue to increase, partially as a result of population growth. Despite the increase in supply of wind energy the world remains heavily dependent on fossil fuels. 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. The share of fossil fuels in the global energy mix is predicted to fall to around 75% in 2035 from 82% today (IEA, 2014), but this nonetheless involves an increase in the world's annual consumption of fossil fuels by around 2300 million tonnes of oil equivalent (Mtoe), over today's levels (see graph right). 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.
Governments continue to establish new energy policies in which the renewables component becomes more and more important. The European Union aims to have 20% renewables in 2020 of which a substantial part consist of wind energy. Seabed preparation for the foundations of windmills are executed by the dredging companies as well as trenching and backfilling for the onshore landing of the energy.

### TOTAL PRIMARY ENERGY SUPPLY




NPS: New Policies Scenario (based on policies under consideration)

450S: 450 Scenario****
(based on policies needed to limit global average temperature increase to 2 °C)

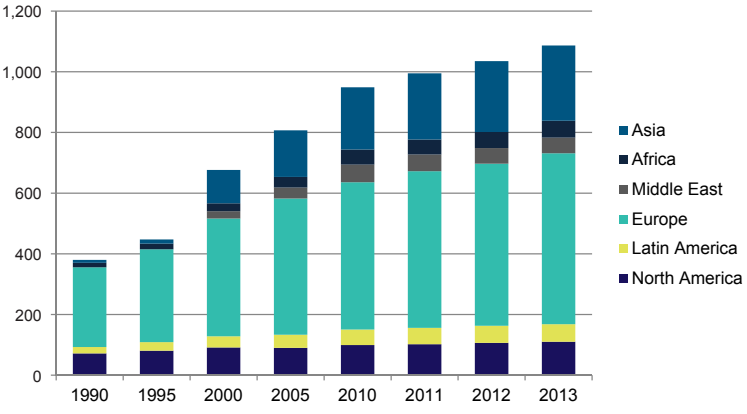
* In these graphs, peat and oil shale are aggregated with coal.
** Includes international aviation and international marine bunkers.
*** Includes biofuels and waste, geothermal, solar, wind, tide, etc.
**** Based on a plausible post-2013 climate-policy framework to stabilise the long-term concentration of global greenhouse gases at 450 ppm CO2-equivalent.

(Source: IEA, 2014)

## TOURISM AND LEISURE

Tourism along coastlines and beaches remains a growing phenomenon. Cruise ships have grown ever larger and demand appropriate maritime infrastructure. Small boat and yacht harbours continue to be attractive. Beach tourism is a major industry in many areas of the world and erosion from weather related events occurs regularly. As a result the annual replenishment of beaches by dredging is executed on a regular basis and is consequently appropriated for in long-term budgets.
Since 2009 the tourism industry shows a steady growth percentage between 4 and 5%. The dredging turnover related to tourism nevertheless decreased from 4 to 3%. International tourist arrivals worldwide are expected to increase by 3.3% a year from 2010 to 2030 to reach 1.8 billion by 2030 (UNWTO).

### INTERNATIONAL TOURIST ARRIVALS 2000-2013 IN MLN




(Source: UNWTO)

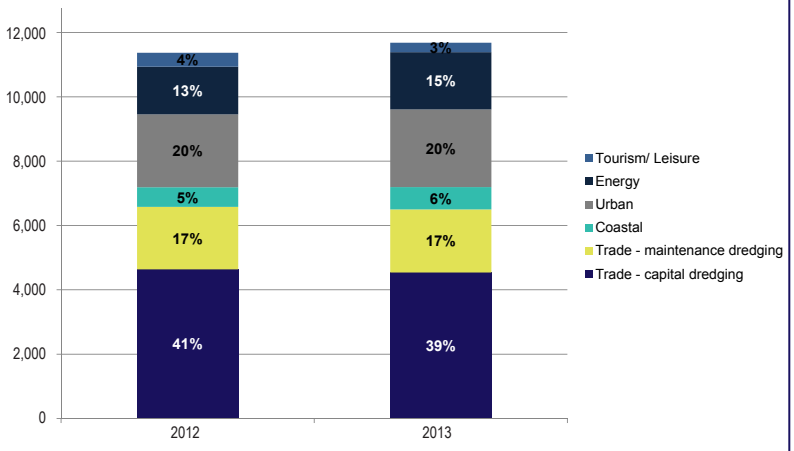
## TURNOVER IN DREDGING

### TURNOVER OF THE GLOBAL DREDGING MARKET 2013 WORLD TRADE

As described above, 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.
The estimated total turnover of global dredging contractors – private as well as state- or port-owned companies – is estimated at €11,680 mln for 2013[1].
The worldwide dredging turnover has increased with 2.7% compared to 2012 (€11,370 mln). Below a comparison is made in de development of drivers and areas between 2012 and 2013.

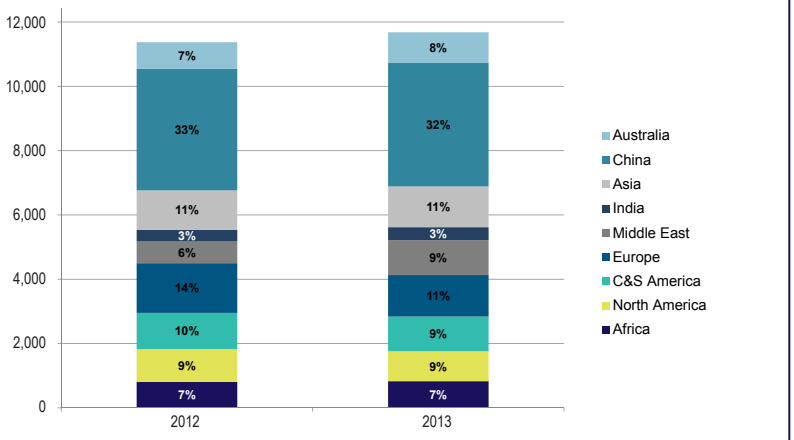
The turnover since 2000 per driver is shown in the table on the next page.

**2012-2013 TURNOVER PER DRIVER IN € MLN**




(Source: IADC)

**2012-2013 TURNOVER PER REGION IN € MLN**




(Source: IADC)

*[1] These figures relates to underwater excavation, transportation and placement of dredged material carried out in 2013. 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 €535 mln relate to rock works that are an integrated part of land reclamations and coastal defence.*

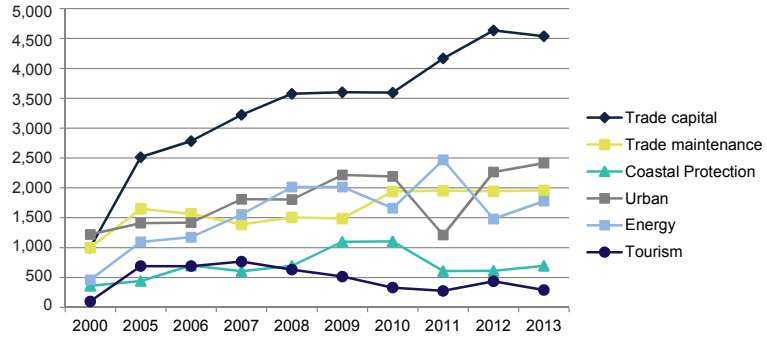
# DREDGING IN FIGURES 2013

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 at the right, in which “others” reflects China, North America and India (closed markets).

The market share of dredging 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 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 45% in 2013 (2012: 46%).

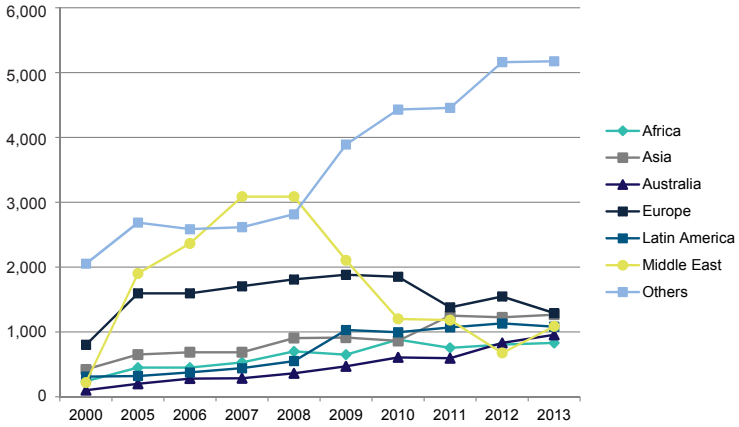
When considering only open markets with free access, the IADC members represent a total of 87% market share in 2013, a clear increase since 2000 (2000 = 75%).

## DEVELOPMENT TURNOVER PER DRIVER IN € MLN



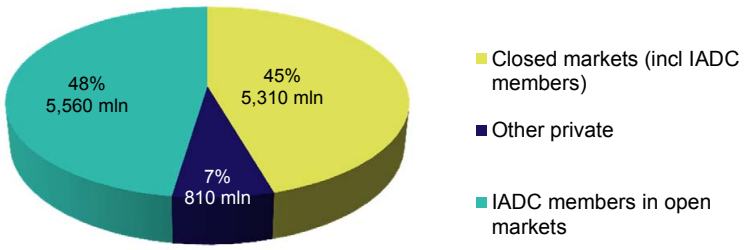

(Source: IADC)

## DEVELOPMENT TURNOVER IN € MLN PER REGION




(Source: IADC)

## OPEN/CLOSED MARKETS




(Source: IADC)

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# DREDGING IN FIGURES 2013

## DEFINITIONS AND METHODOLOGY

This review relates to the annual turnover estimated for 2013. 'Carried out in 2013' therefore does not necessarily mean 'contract awarded in 2013', nor that payment was received in 2013. It only reflects work that was actually performed in 2013. For projects only partially performed in 2013 (e.g., a project started on 1-6-2012 and finalised on 30-6-2013), the value of the part actually executed in 2013 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. 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 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 (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.

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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.*

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