OIL SPILLS

ESTIMATES GLOBAL CARBON IMPACT

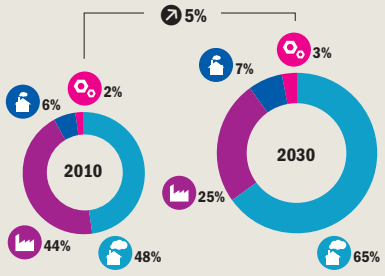
2010 EFFECT TODAY

USD **LOSS** PER YEAR **10 BILLION**

2030 EFFECT TOMORROW

USD **LOSS** PER YEAR **40 BILLION**

ECONOMIC IMPACT



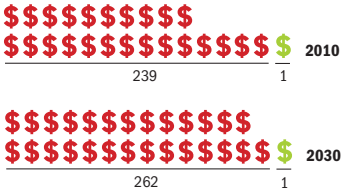
CONFIDENCE **INDICATIVE**

SEVERITY

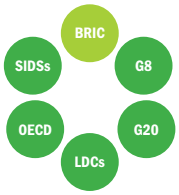
AFFECTED

MDG EFFECT

RELATIVE IMPACT



GEOPOLITICAL VULNERABILITY



- Oil spills are one of the most graphic manifestations of the environmental risks run by a carbon economy reliant on fossil fuels
- Oil is expected to remain the world's principal fuel well beyond 2030: by then consumption is expected to be some 25% higher than today
- Despite the 2010 Gulf of Mexico disaster an increase in deep-water oil drilling is foreseen as the frontier for new petroleum reserves advances, pushing up against the limits of exploration and exploitation
- The dangers associated with deep-water drilling are expected to cause considerable further increases in the environmental and economic costs of oil spills

HOTSPOTS

2010 $ 2030

3,250 **KUWAIT** 15,000

2,000 **SAUDI ARABIA** 8,000

3,500 **UNITED STATES** 6,250

350 **ECUADOR** 1,500

300 **SINGAPORE** 1,250

$ Economic Cost (2010 PPP non-discounted)

Developing Country Low Emitters | Developed

Developing Country High Emitters | Other Industrialized

$ = Losses per 10,000 USD of GDP

Change in relation to overall global population and/or GDP

$ = Millions of USD (2010 PPP non-discounted)

Improvements in operating safety leading to decreased risks of oil spills in recent decades have occurred in parallel to increases in consumption and new risks associated with deep-water drilling now expected to lead to even greater damage in the years to come in spite of progress made. The April, 2010 BP Gulf of Mexico oil disaster, triggered by an explosion on the ultra deep-water Macondo Well rig, released five million barrels of crude oil into the sea. The unabated stream flowed for months and led to tens of billions of dollars of direct economic damage and profound ecological consequences. Half a year after the spill 32,000 square miles of sea remained closed with much of the American fishing industry unable to operate (Graham and Reilly, 2011). The oil firms themselves and their shareholders also suffered: BP saw its share price fall by more than half in a matter of months and is still to recover as tens of billions of dollars in value were erased forever (Grant, 2010). Analysis has shown that similar incidents cause affected companies roughly 10% losses in market value six months after such accidents (Laguna and Capelle-Blancard, 2010). From 2002 to 2015, deep-water oil exploitation is expected to emerge as a major source of fuel, growing from 2% to around 12% of all global oil production (Douglas–Westwood, 2010). With it the danger of repeats of the Gulf of Mexico disaster will only increase: the risk of abnormal incidents on offshore facilities triples for deep-water oil platforms operating in water depths below 300 metres or 1,000 ft (Cohen, 2011).

HAZARD MECHANISM

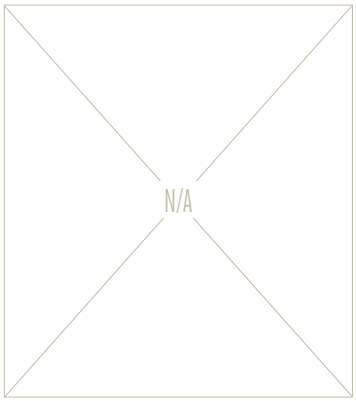
The vast majority of oil spills occur in the world's oceans as the principal global energy source – oil – is transported to feed a worldwide demand for a product with highly restricted geographical availability (ERC, 2009; US EIA, 2011). Oil spills occur along global supply chains between key source and destination nodes. When an oil spill occurs there is a predictable and measurable relationship between the amount of surface water contaminated and a corresponding economic loss divided between environmental or biodiversity costs, such as the decimation of birds and other local wildlife populations, socio-economic costs, such as the loss of fishing revenues, and spill response costs, which include the cost of clean-up (Etkin, 2004). The level of economic costs ultimately experienced is determined by factors such as the location of the spills (far offshore, or in a coastal area), the type of oil released into the environment (more viscous and therefore more costly to remove, or vice versa), and environmental conditions prevailing in the days and weeks following the incident (such as ocean currents that disperse or concentrate oil slicks) (McCay, 2004).

IMPACTS

The global impact of oil spills on the world economy is estimated at 12 billion dollars a year today, and is expected to nearly triple to more than 30 billion dollars a year in 2030 but with losses remaining stable as a share of GDP.

On the basis of historical trends in oil spills only a limited number of countries are expected to suffer disproportionately from the growing risk of oil spills. Some 25 countries show globally significant vulnerabilities to oil spills, each either major oil producing or consuming countries, global supply chain nodes like Singapore or neighbouring states. Middle East countries such as Kuwait and Saudi Arabia top the list of those countries most vulnerable to oil spills. The greatest share of effects is estimated to impact Kuwait, Russia, Saudi Arabia and the US, each suffering more than one billion dollars in average annual losses in 2010. These cost estimations are averages, so that one billion dollars of losses in one year might represent a 20 billion dollar loss once every 20 years.

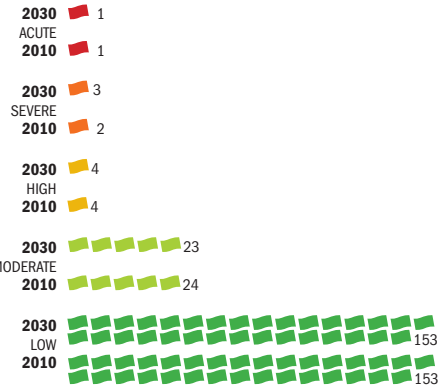
BIGGER PICTURE



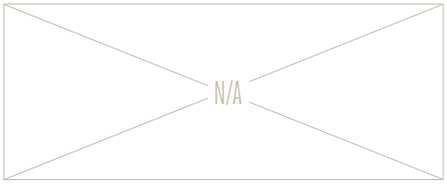
SURGE

OCCURRENCE

VULNERABILITY SHIFT



PEAK IMPACT



GENDER BIAS

INDICATOR INFORMATION

MODEL: Muehlenbachs et al., 2011; Schmidt, 2004; Westwood, 2010

BASE DATA: CEDRE, 2010; Tryse, 2010

Acute Severe High Moderate Low

Number of major oil spills per decade (over 10,000 tones of oil spilled)

= 5 countries (rounded)

THE INDICATOR

The indicator measures the costs of oil spills in terms of environmental damage and is based on a pooled database of information on global oil spill incidents (Etkin, 2004; Tryse, 2010; CEDRE, 2012; Center for Tankship Excellence, 2012). Costs are assumed to affect countries listed as sites for oil spills in the past, which biases the predicted distribution of oil spill disasters. These might otherwise only be estimated in a semi-random manner, since each oil spill event is unique and random. It also does not take account of shifts in production that could occur over the next 20 years as new countries discover and expand exploitation, in particular of large scale offshore oil reserves: Brazil, for instance, is expected to become the world's fourth largest non-Organisation of Petroleum Exporting Countries (OPEC) supplier of conventional oil by 2035 (US EIA, 2011). Cost estimates of spills have been based on incidents in the US, with costs for other countries determined in relation to GDP.

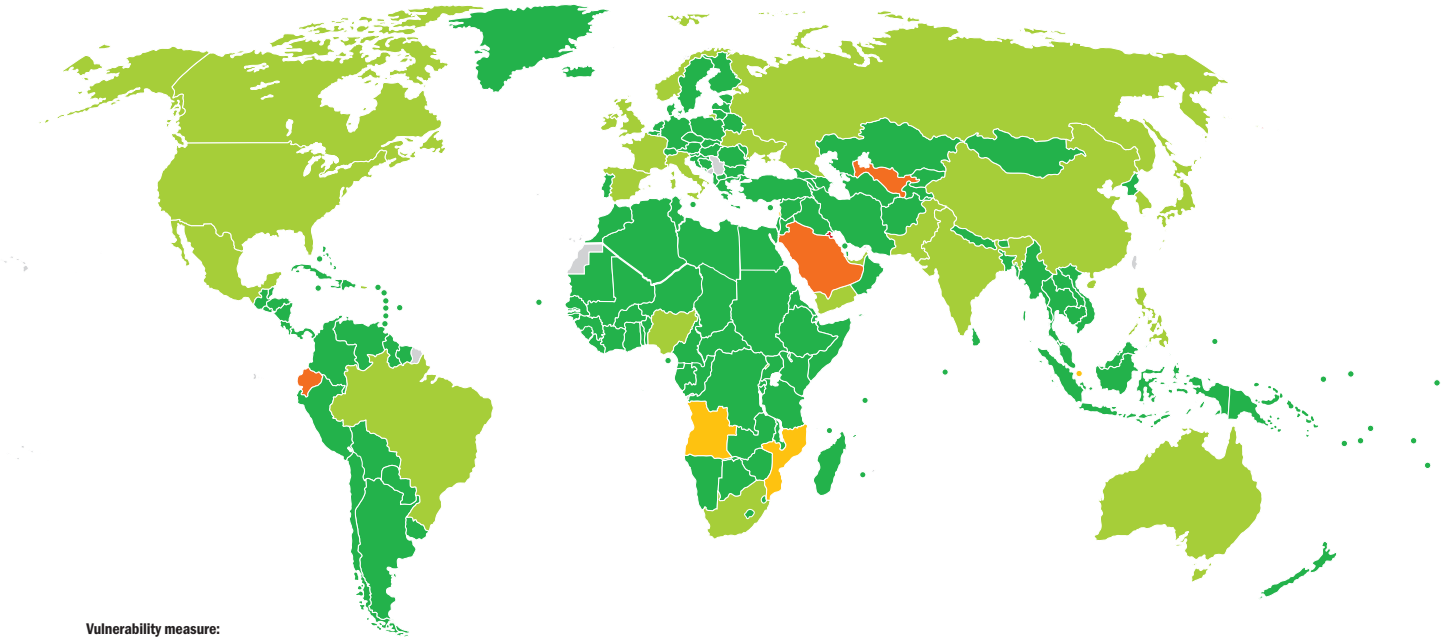
ESTIMATES COUNTRY-LEVEL IMPACT

COUNTRY	2010	2030	2010	2030
ACUTE				
Kuwait	3,250	15,000	8,250	9,000
SEVERE				
Ecuador	350	1,500	2,750	3,000
Saudi Arabia	2,000	8,000	8,250	9,000
Uzbekistan	250	850	4,250	4,750
HIGH				
Angola	250	850	4,250	4,500
Lebanon	65	250	400	450
Mozambique	20	65	1,250	1,250
Singapore	300	1,250	500	500
MODERATE				
Australia	100	200	550	600
Brazil	5	20	50	55
Canada	20	35	80	85
China	60	350	600	650
France	85	150	400	400
India	1	5	15	15
Ireland	5	5	15	15
Italy	450	750	2,250	2,500
Japan	60	90	300	300
Mexico	5	25	40	45
Nigeria	40	150	1,000	1,250
Norway	20	30	75	85
Pakistan	25	100	450	500
Philippines	1	5	20	20
Russia	300	1,000	1,500	1,750
South Africa	5	10	30	35
South Korea	55	250	150	150
Spain	500	800	2,250	2,500
Ukraine	1	5	10	10
United Arab Emirates	50	200	250	250
United Kingdom	650	1,000	2,500	2,750
United States	3,500	6,250	15,000	15,000
Yemen	10	30	200	200
LOW				
Afghanistan				
Albania				
Algeria				
Antigua and Barbuda				
Argentina				
Armenia				
Austria				
Azerbaijan				
Bahamas				
Bahrain				
Bangladesh				
Barbados				
Belarus				
Belgium				
Belize				
Benin				
Bhutan				
Bolivia				
Bosnia and Herzegovina				
Botswana				
Brunei				
Bulgaria				
Burkina Faso				
Burundi				
Cambodia				
Cameroon				
Cape Verde				
Central African Republic				
Chad				
Chile				
Colombia				
Comoros				
Congo				
Costa Rica				
Cote d,Ivoire				
Croatia				
Cuba				
Cyprus				
Czech Republic				
Denmark				
Djibouti				
Dominica				
Dominican Republic				
DR Congo				
Egypt				
El Salvador				
Equatorial Guinea				
Eritrea				
Estonia				
Ethiopia				
Fiji				
Finland				
Gabon				
Gambia				
Georgia				
Germany				
Ghana				
Greece				
Grenada				
Guatemala				

$ Additional economic costs (million USD PPP) - yearly average

CARBON VULNERABILITY

Acute Severe High Moderate Low



Vulnerability measure: comparative losses as a share of GDP in USD (national)

COUNTRY	$ 2010	$ 2030	▮ 2010	▮ 2030
Guinea				
Guinea-Bissau				
Guyana				
Haiti				
Honduras				
Hungary				
Iceland				
Indonesia				
Iran				
Iraq				
Israel				
Jamaica				
Jordan				
Kazakhstan				
Kenya				
Kiribati				
Kyrgyzstan				
Laos				
Latvia				
Lesotho				
Liberia				
Libya				
Lithuania				
Luxembourg				
Macedonia				
Madagascar				
Malawi				
Malaysia				
Maldives				
Mali				
Malta				
Marshall Islands				

COUNTRY	$ 2010	$ 2030	▮ 2010	▮ 2030
Mauritania				
Mauritius				
Micronesia				
Moldova				
Mongolia				
Morocco				
Myanmar				
Namibia				
Nepal				
Netherlands				
New Zealand				
Nicaragua				
Niger				
North Korea				
Oman				
Palau				
Panama				
Papua New Guinea				
Paraguay				
Peru				
Poland				
Portugal				
Qatar				
Romania				
Rwanda				
Saint Lucia				
Saint Vincent				
Samoa				
Sao Tome and Principe				
Senegal				
Seychelles				
Sierra Leone				

COUNTRY	$ 2010	$ 2030	▮ 2010	▮ 2030
Slovakia				
Slovenia				
Solomon Islands				
Somalia				
Sri Lanka				
Sudan/South Sudan				
Suriname				
Swaziland				
Sweden				
Switzerland				
Syria				
Tajikistan				
Tanzania				
Thailand				
Timor-Leste				
Togo				
Tonga				
Trinidad and Tobago				
Tunisia				
Turkey				
Turkmenistan				
Tuvalu				
Uganda				
Uruguay				
Vanuatu				
Venezuela				
Vietnam				
Zambia				
Zimbabwe				

▮ Gallons of oil spilled (thousands) - yearly average