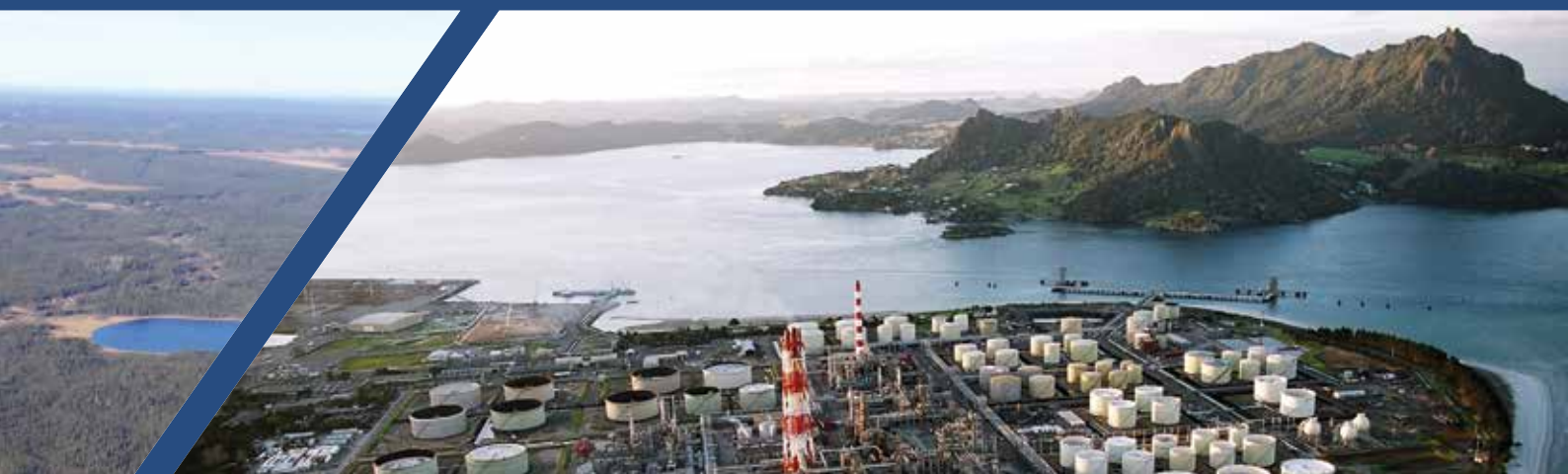


An International Comparison of Leading Oil and Gas Producing Regions

Environmental Regulation



WorleyParsons
resources & energy



CAPP
CANADIAN ASSOCIATION
OF PETROLEUM PRODUCERS
Canada's Oil and Natural Gas Producers

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This report was produced by WorleyParsons in London, England and Calgary, Alberta, Canada and commissioned by the Canadian Association of Petroleum Producers utilizing survey data collected from offices located in 10 regions around the world. For a list of participating locations, please refer to the inside back cover.

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Executive Summary

The purpose of this study was to compare Alberta, Canada with other locations around the world in terms of their environmental policies, laws and regulatory systems. Other locations that were compared with Alberta included states and countries in North America (USA North Dakota and USA Gulf of Mexico), South America (Brazil), Australia (Queensland), Asia-Pacific (Malaysia), Middle East (Oman), Africa (Ghana) and Europe (United Kingdom and Norway).

The study was intended to examine and compare environmental policies, laws and regulatory systems as of December 2013; and not intended to evaluate “performance” or “effectiveness” of the governments. In particular, the survey was meant to evaluate the systems, processes and controls that exist within the evaluated jurisdictions and not how effectively and efficiently the jurisdictions are operating. Also, the study should not be seen as a direct comparative analysis, as cultures, governance models and maturity of governments are highly variable.

In order to be fair in the comparison, countries were chosen that might be most similar to Alberta (at least one from each global region) based upon their recent levels of oil and gas activity, and the relative maturity and comparative openness (for their region) of their government. In other words, are they as mature, open and active as Alberta?

The study compared the environmental laws and government processes with respect to stringency (How comprehensive are the environmental laws?), transparency (How easily can the public get information?), and compliance (Which country has rules to ensure compliance?).

Stringency, transparency and compliance were studied by looking at three stages in the life cycle of a major oil and gas project: approval of the project, construction and operations, and closure or decommissioning.

The review of 10 jurisdictions, representing seven major continental regions across the world, revealed that Alberta, Canada; Queensland, Australia; and the United States, Gulf Coast were consistently leading in a comparison of existing environmental policies, laws and regulatory systems. We fully expect that some countries and jurisdictions that were not compared would also be top performers in environmental regulation. The intent of this survey was to compare Alberta Canada in a fair manner with nine other countries/regions from every part of the oil and gas producing world.

Methods

1. Ten regions for study were selected from 75 possible countries based upon their recent oil and gas industry activity levels, governance and maturity.
2. During the selection of countries or states, some regions (such as North America) were over-represented; while other regions (such as Africa and the Middle East) were under-represented. The final 10 countries included “best fit” from their region to allow for global representation.
3. Survey questions were developed by a team of experienced international experts based upon the concepts of stringency, transparency, and compliance. Questions were vetted by the 10 participating jurisdictions.
4. Survey questions looked at the three stages in the lifecycle of a major hydrocarbon project: approvals, construction and operations, and closure.
5. WorleyParsons’ international experts with work experience in each of the study countries were asked to answer the questions through an online survey.
6. The results of the survey were gathered, categorized and sent back to the international experts for review and validation.
7. Multiple rounds of review and quality checks were completed on the survey results.
8. The final answers were scored without weighting or scaling, and presented.

Managing Study Bias

The study followed a strict quality review process to minimize bias and to assure accuracy of results.

The review involved international experts from each country or region; 14 regulatory advisors; and five global senior reviewers with many years of international oil and gas industry experience. Where relevant, local regulators were also consulted.

It was anticipated that bias concerns could arise from the interpretation of questions asked in the survey. For this reason, the survey questions used concepts reviewed by international subject matter experts (SMEs) who live and work in each of the regions. Survey questions were asked in a manner that the SMEs would or could have seen and defined the situation in their past work experience.

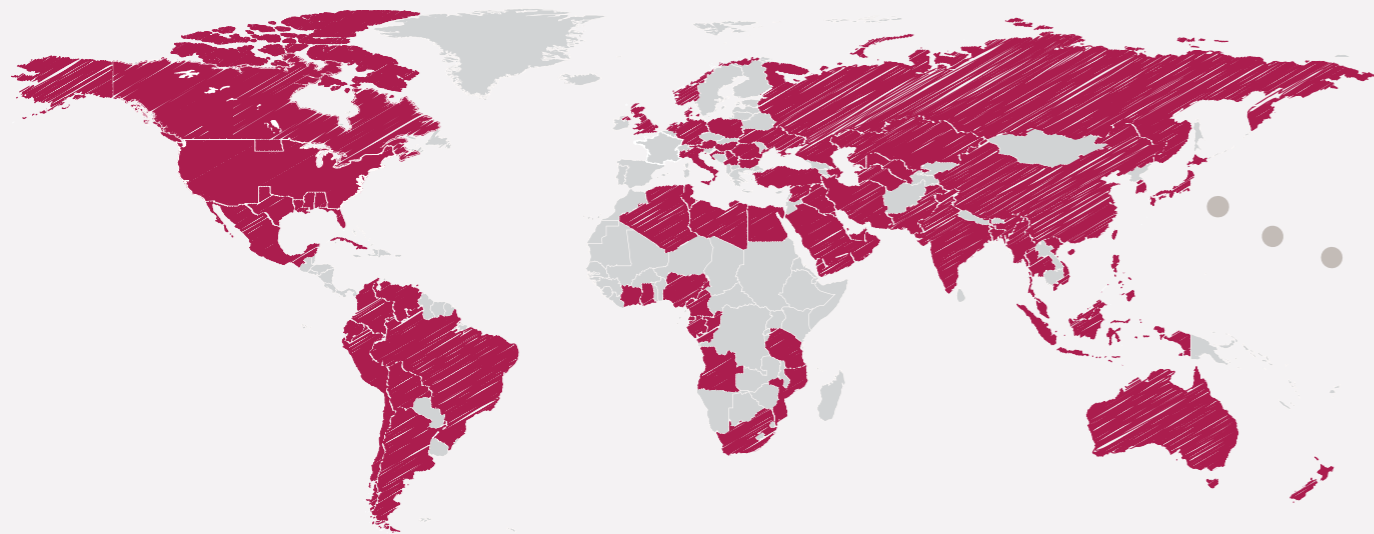
Most of the questions required either a yes/no answer or a numerical response, such as a date or quantity. No weightings were applied to any of the questions. Yes and no questions were scored using a value of either one (yes) or zero (no). Questions with a wider range of responses were ranked based upon a simple continuum, typically one to three.

Survey questions that did not apply to all 10 countries or regions were removed from the scoring.

The international experts were not provided the results of other countries until the report was complete. This was done to avoid the temptation of “national competition”. The experts completed three rounds of quality reviews to confirm and validate their results.

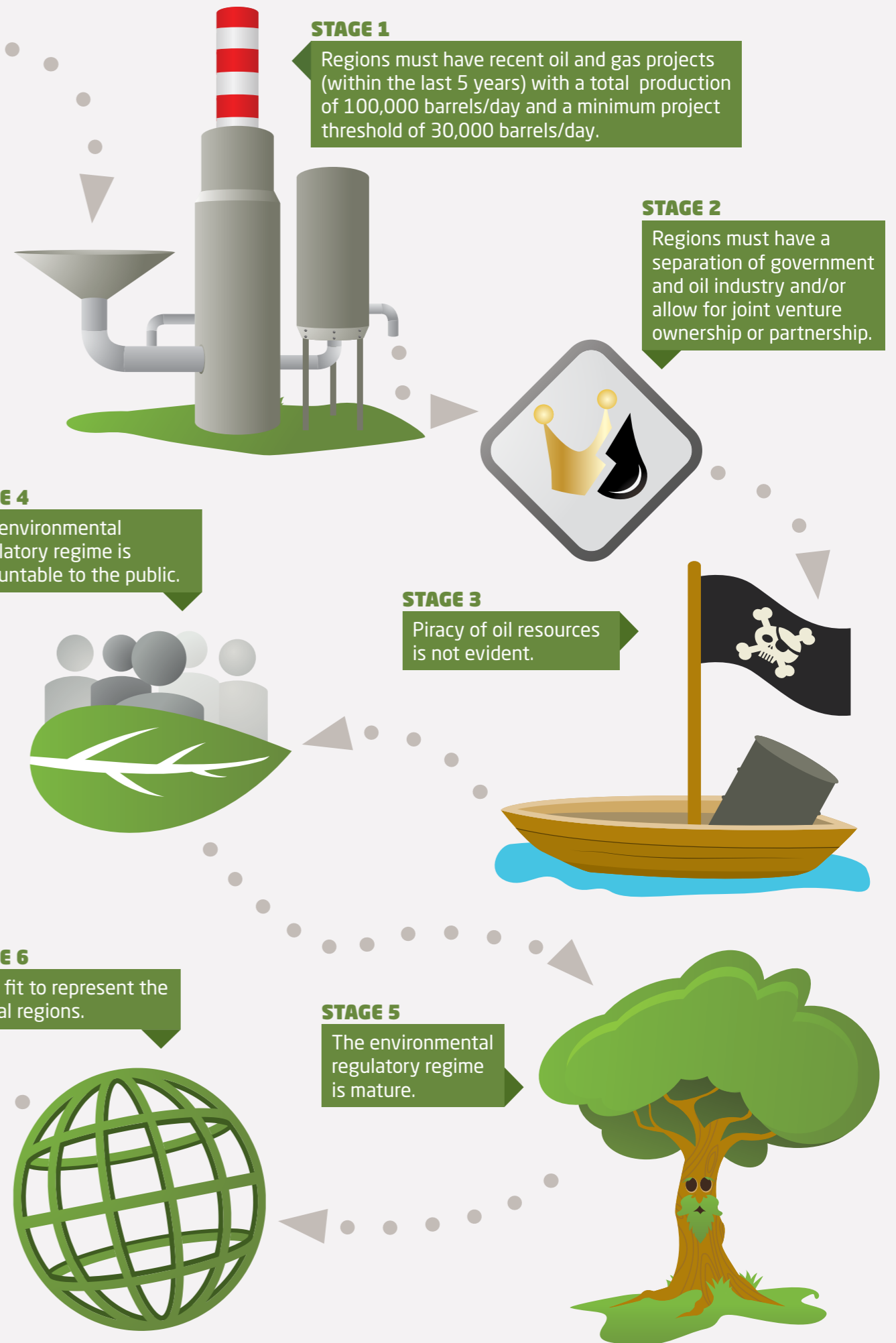
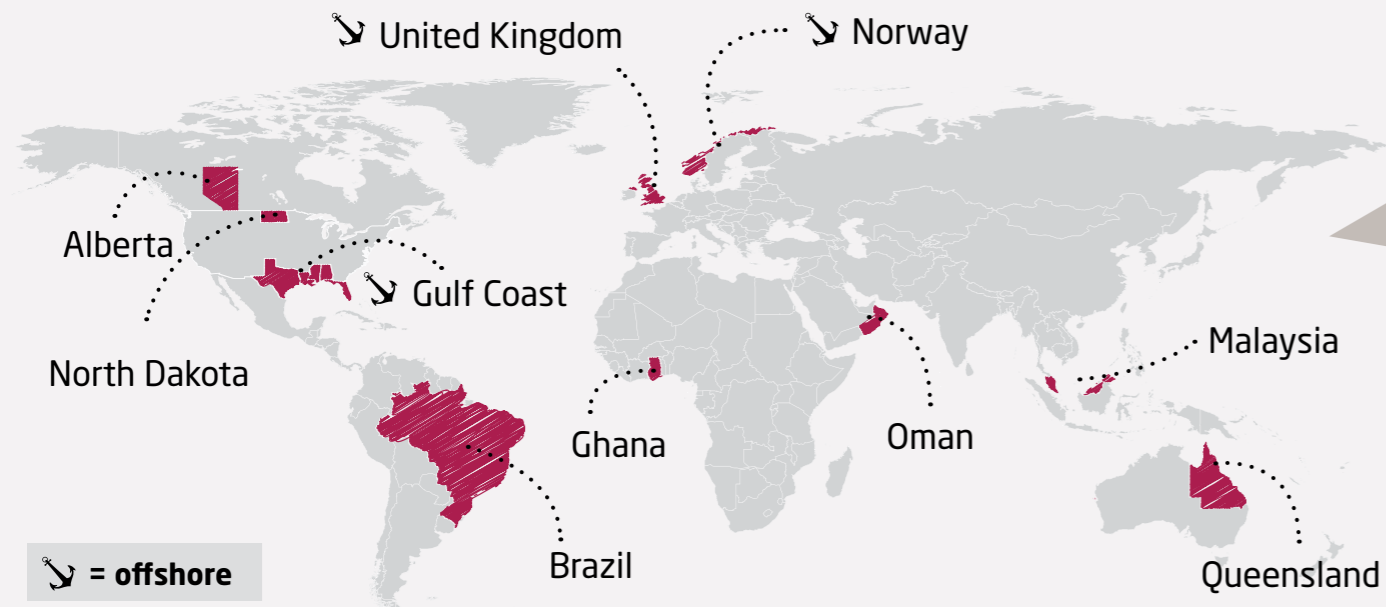
Selection of Countries

THE STUDY BEGAN WITH A REVIEW OF THE TOP 75 OIL AND GAS PRODUCING NATIONS ACCORDING TO THE U.S. ENERGY INFORMATION ADMINISTRATION STATISTICS FOR 2011.



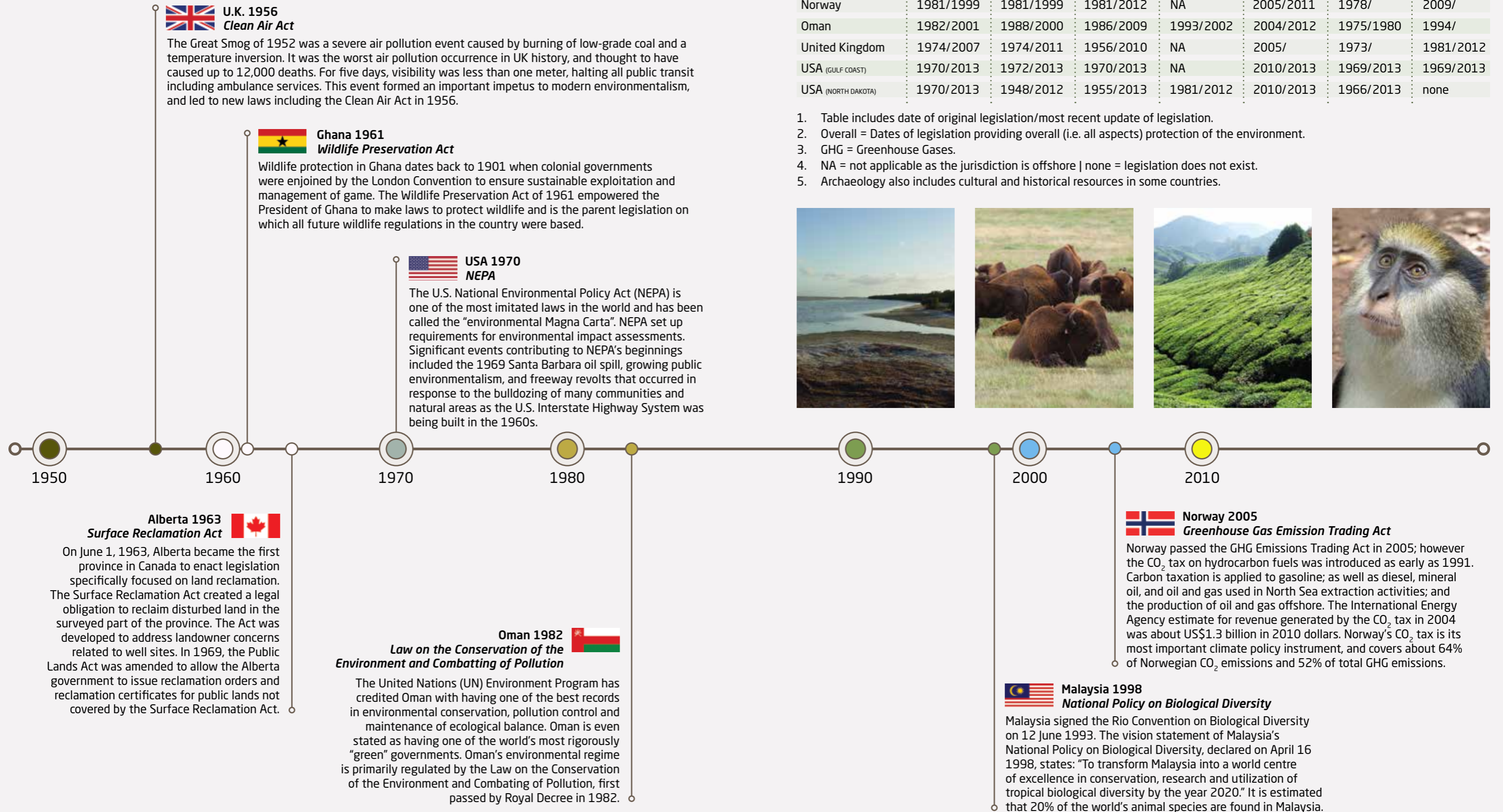
The Final 10

The final 10 countries or regions were chosen based on their similarity to Alberta as of 2014 based upon their recent levels of oil and gas activity, and the maturity and comparative openness (for their region) of their government. In other words, to make for a fair comparison, the 10 final countries were chosen because they are as mature, open and active as Alberta, or as close as possible for their given region.



When did environmental regulation begin?

A SAMPLE OF LANDMARK REGULATIONS



| | Overall | Water | Air Quality | Land | GHG | Archaeology | Biodiversity |
|------------------------|-----------|-----------|-------------|-----------|-----------|-------------|--------------|
| Australia (QUEENSLAND) | 1974/2013 | 1971/2013 | 1963/2012 | 1902/2013 | 2007/2012 | 1967/2013 | 1906/2013 |
| Brazil | 1981/1998 | 1934/2011 | 1988/1990 | 1965/2012 | 2009/ | 1933/1988 | 1981/2007 |
| Canada (ALBERTA) | 1992/2013 | 1931/2013 | 1961/2000 | 1931/2013 | 2008/2013 | 1973/2008 | 1985/2013 |
| Ghana | 1983/2002 | 1956/ | none | 1953/ | 2005/ | 1945/ | 1961/ |
| Malaysia | 1974/2010 | 1979/2000 | 1978/2004 | 1960/2009 | none | 1976/2005 | 1994/1998 |
| Norway | 1981/1999 | 1981/1999 | 1981/2012 | NA | 2005/2011 | 1978/ | 2009/ |
| Oman | 1982/2001 | 1988/2000 | 1986/2009 | 1993/2002 | 2004/2012 | 1975/1980 | 1994/ |
| United Kingdom | 1974/2007 | 1974/2011 | 1956/2010 | NA | 2005/ | 1973/ | 1981/2012 |
| USA (GULF COAST) | 1970/2013 | 1972/2013 | 1970/2013 | NA | 2010/2013 | 1969/2013 | 1969/2013 |
| USA (NORTH DAKOTA) | 1970/2013 | 1948/2012 | 1955/2013 | 1981/2012 | 2010/2013 | 1966/2013 | none |

1. Table includes date of original legislation/most recent update of legislation.
2. Overall = Dates of legislation providing overall (i.e. all aspects) protection of the environment.
3. GHG = Greenhouse Gases.
4. NA = not applicable as the jurisdiction is offshore | none = legislation does not exist.
5. Archaeology also includes cultural and historical resources in some countries.



List of Survey Questions

SURVEY QUESTIONS - STRINGENCY

| PROJECT STAGE: APPROVALS | PROJECT STAGE: OPERATIONS | PROJECT STAGE: CLOSURE |
|--|--|--|
| <p>1 Does the government have requirements to conduct Environmental Impact Assessments (EIAs) for specified development projects?</p> <p>2 What is the average length of time for large-scale hydrocarbon projects (greater than 30,000 bpd) to receive approval (within the last 5 years)?</p> <p>3 What is the average cost to prepare an application and seek approval for large-scale hydrocarbon projects (last 5 years)?</p> <p>4 Are there opportunities for stakeholders to review and provide input on regulatory applications?</p> <p>5 How many staff are utilized by each regulator for the environmental review of major project applications?</p> | <p>6 Are renewals on environmental regulatory permits required?</p> <p>7 For what and how often are renewals required?</p> <p>8 Is environmental monitoring and reporting required during operations?</p> <p>9 Is an Operations Environmental Management Plan required to be submitted and approved by the regulatory authority?</p> <p>10 Are cumulative effects monitored? <i>e.g. air quality (NOx, SOx).</i></p> <p>11 Are there requirements for continuous monitoring?</p> <p>12 Are environmental monitoring criteria and thresholds defined through regulations?</p> <p>13 If environmental monitoring criteria and thresholds are defined, please describe.</p> | <p>14 Are closure plans required? If yes, when are they required?</p> <p>15 Is there regulatory mandated remediation and reclamation at facility end of life?</p> <p>16 Are there defined (prescribed thresholds) remediation and reclamation standards or are risk-based remediation and reclamation methods used?</p> <p>17 Are reclamation certificates issued by the government?</p> <p>18 Are there bond or financial security requirements against end-of-life facility liability?</p> <p>19 Is there a government-run program that can be implemented to remediate and reclaim orphaned facilities and oil wells in cases where a company defaults?</p> |

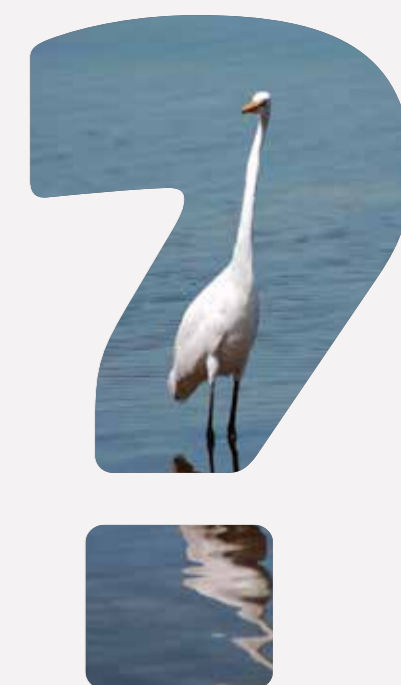
SURVEY QUESTIONS - COMPLIANCE

| PROJECT STAGE: APPROVALS | PROJECT STAGE: OPERATIONS | PROJECT STAGE: CLOSURE |
|---|---|---|
| <p>1 Is a Construction Environmental Management Plan required to be submitted and approved by the regulatory authority?</p> <p>2 If conditions are stipulated or put in place for a regulatory approval (<i>e.g. licence, permit, etc.</i>) are there mechanisms to check or ensure compliance with the approval?</p> <p>3 If so, what are the mechanisms?</p> <p>4 Is there standard terms of reference for the environmental assessment process?</p> <p>5 If so, is there a set threshold for a project to meet the terms of reference to gain approval?</p> | <p>6 Are there consequences for regulatory non-compliance?</p> <p>7 Does the regulatory authority have the mandate to enforce environmental regulations?</p> <p>8 List examples of regulatory mechanisms or tools for enforcement.</p> <p>9 Does the government publish a list of regulatory infractions/non-compliance events/fines and penalties?</p> <p>10 Is there whistleblower legislation to protect whistleblowers from losing their jobs or other consequences?</p> <p>11 Can available testing laboratories achieve detection limits for legislated thresholds?</p> | <p>12 Is there a regulatory mechanism that exists to ensure a company properly remediates and reclaims a decommissioned facility?</p> <p>13 Is long-term monitoring required past the end of life of the facility? If so, how long is monitoring required past the end of life of a facility?</p> |

SURVEY QUESTIONS - TRANSPARENCY

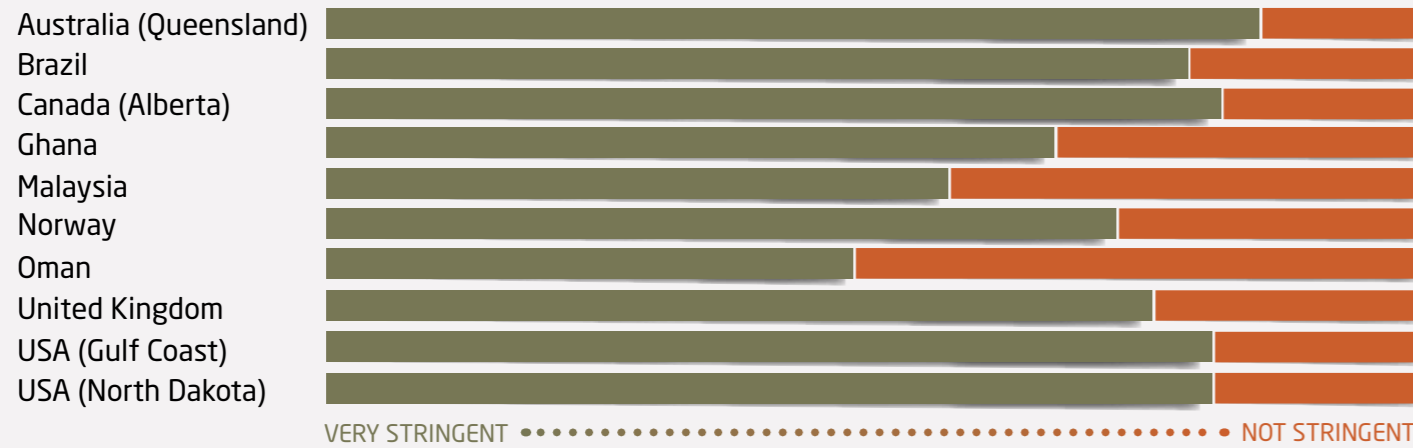
| PROJECT STAGE: APPROVALS | PROJECT STAGE: OPERATIONS | PROJECT STAGE: CLOSURE |
|---|---|---|
| <p>1 Is there freedom of information legislation?</p> <p>2 Are regulatory approval processes and requirements readily available to the public?</p> <p>3 Is the public able to provide input into draft legislation?</p> <p>4 Is there legislation in place that requires a project approval to demonstrate that the project is in the "best interest" of the public?</p> <p>5 Is a basis for decision (project approval/rejection) communicated to the public? (<i>i.e. Decision Reporting</i>).</p> <p>6 Are stakeholders able to provide input and/or intervene on project applications?</p> <p>7 Describe the method(s) that intervenors can provide input.</p> <p>8 Is there any type of duty to consult in legislation? <i>e.g. duty to consult "affected parties", or indigenous people(s)</i></p> <p>9 Do the due process requirements include processes for public hearings and/or information requests? (<i>e.g. hearings, Supplemental Information Requests, intervention</i>)</p> <p>10 Is there a public appeal process for regulatory decisions? (<i>i.e. Environmental Appeal Board</i>)</p> <p>11 Is there a project proponent appeal process for regulatory decisions?</p> | <p>12 Are monitoring reports/data available to the general public?</p> <p>13 If so, please specify the media (air, water, soil, emissions).</p> <p>14 Does the government track and report non-compliance events to the public?</p> <p>15 Is there a requirement for reporting incidents?</p> <p>16 Is there a formal regulatory audit process in place for monitoring compliance?</p> <p>17 If there is a regulatory audit process, at what frequency is it implemented, or is it impromptu/ad hoc?</p> <p>18 Is there a process to audit the regulator itself (<i>e.g. auditor general</i>)?</p> | <p>19 Are facility closure plans available to the public?</p> <p>20 Does the government report on facility reclamation/reclamation certification?</p> <p>21 If an orphan well/facility program exists, does it publicly report activities, progress and financials?</p> <p>22 Are companies required to document and report remediation and reclamation of facilities to regulators?</p> <p>23 Is the remediation and reclamation of facilities reported by regulators to stakeholders?</p> <p>24 Are there documented rates on the frequency of defaults where companies do not meet their end-of-facility-life obligations?</p> |

*Stringency, Compliance, and Transparency questions correlate with survey results shown on pages 20 - 21.



How comprehensive are the environmental laws?

STRINGENCY RESULTS



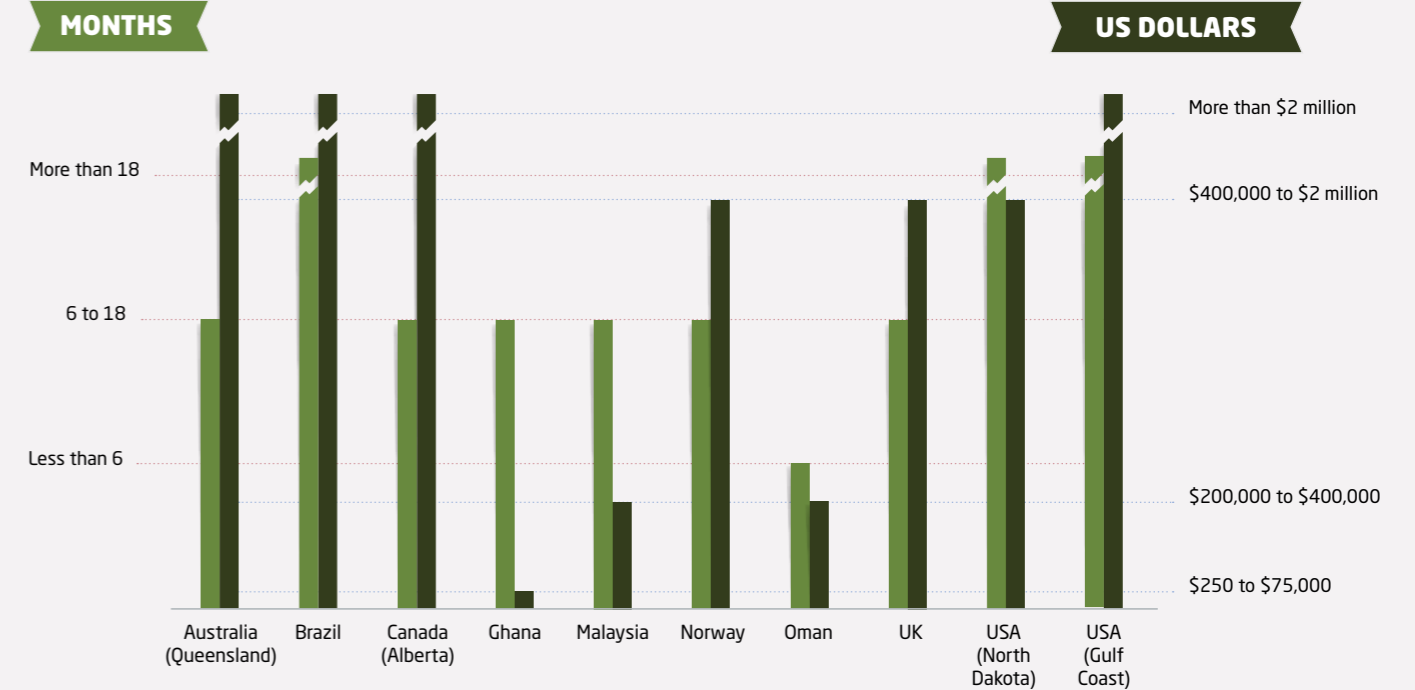
Stringency considered factors such as requirements for project approvals, time and cost to obtain an approval, number of regulators reviewing applications, opportunities for the public to review and comment, requirements for monitoring, facility license renewals, cumulative effects, closure planning, decommissioning requirements, and government security requirements.

Some key differentiators between countries included: the average length of time for large-scale hydrocarbon projects to receive regulatory approval; the average cost to prepare an application; how many staff are utilized by the regulatory agencies for environmental review on major project applications; and whether the jurisdiction has bond or financial security requirements against end-of-life facility liability.

TWO QUESTIONS RELATING TO STRINGENCY

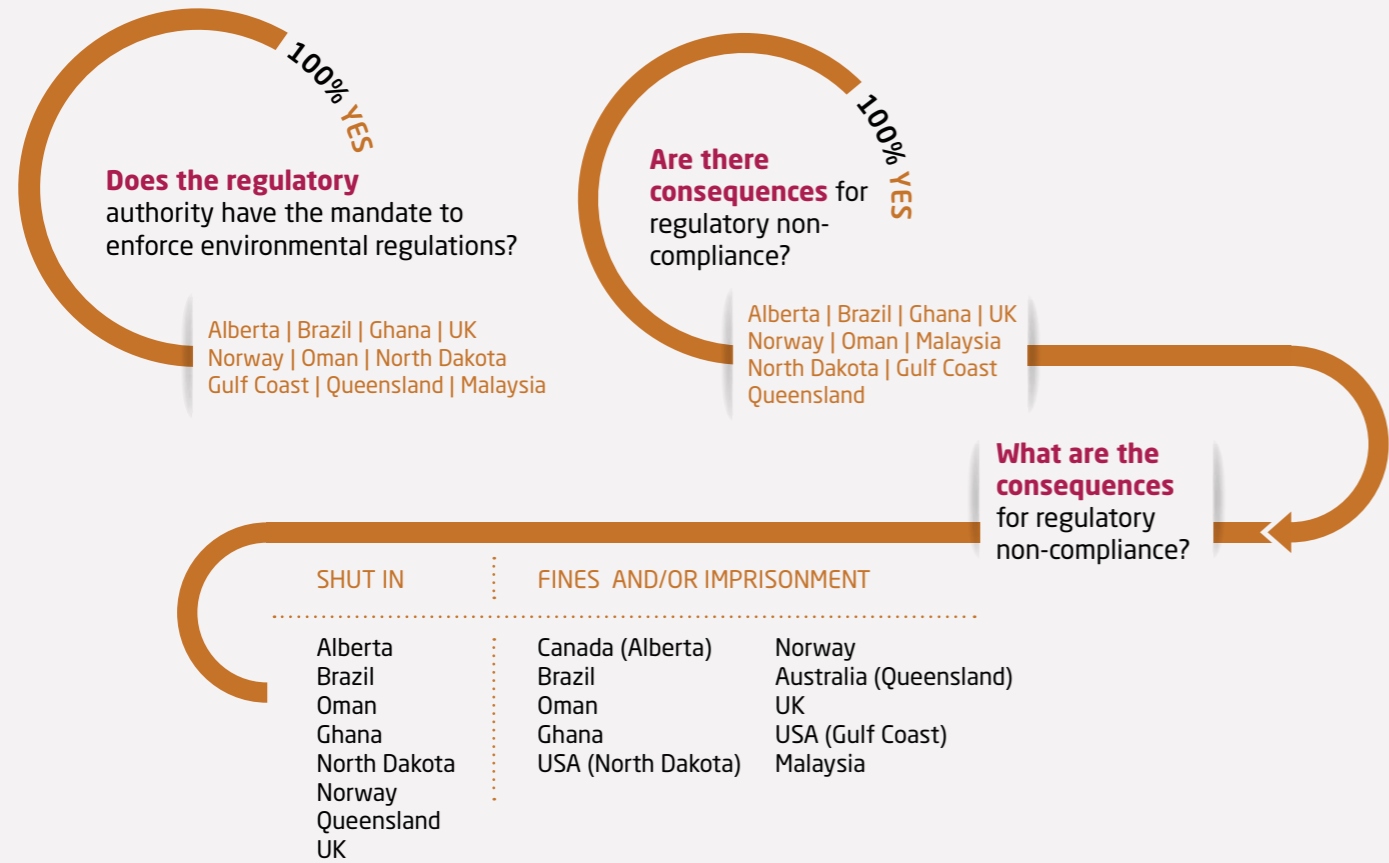
What is the average length of time (over the last 5 years) for large-scale hydrocarbon projects (greater than 30,000 bpd) to receive approval, from the time of submission of an application to final government approval?

What is the average cost (last 5 years) for the entire approval preparation and application process?



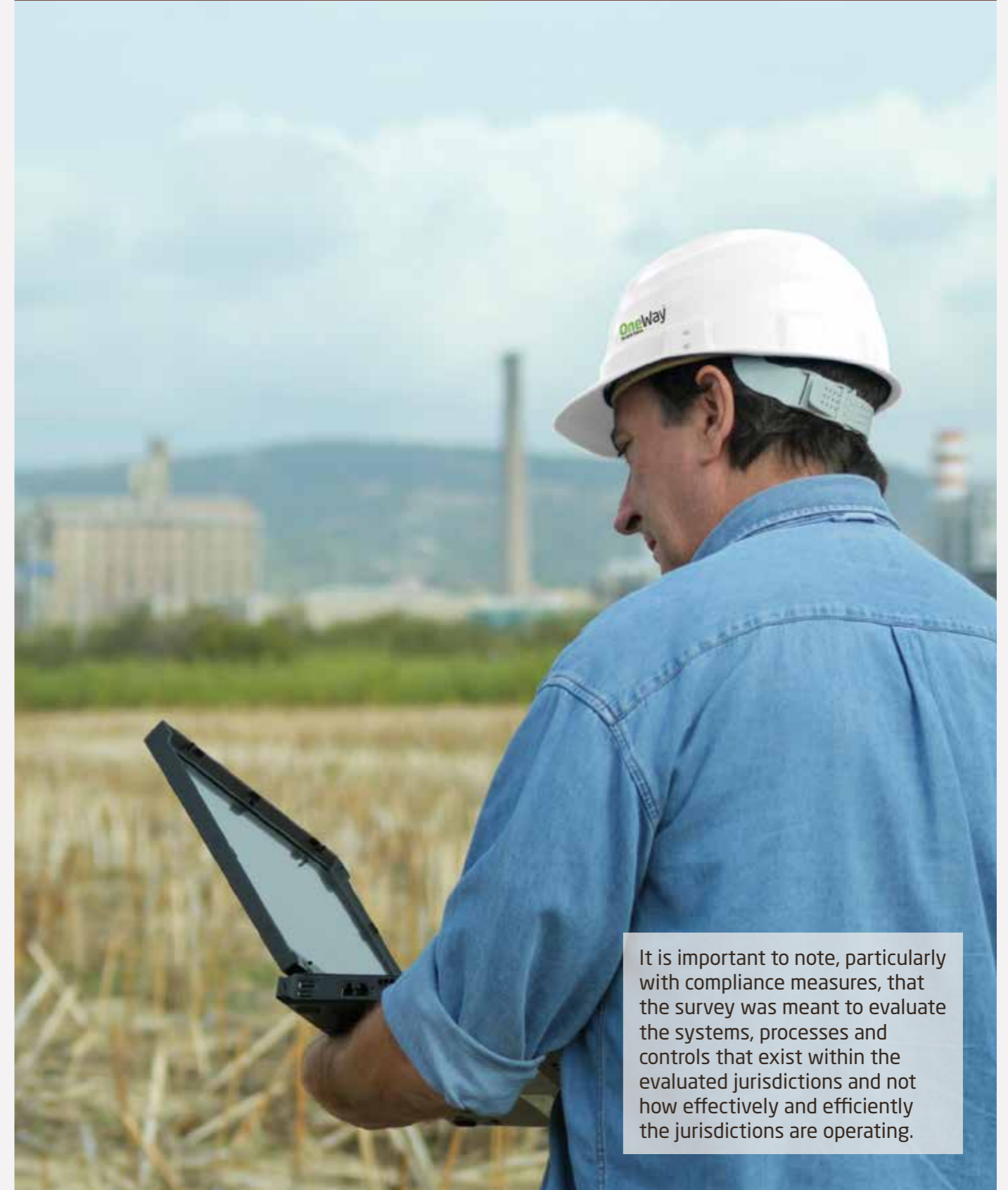
Which country or region has rules to ensure compliance?

COMPLIANCE RESULTS



Compliance-based questions considered factors such as mechanisms to monitor compliance, consequences for non-compliance or non-performance, enforcement of regulations, penalties, default rates, approval requirements, and post-closure long-term monitoring.

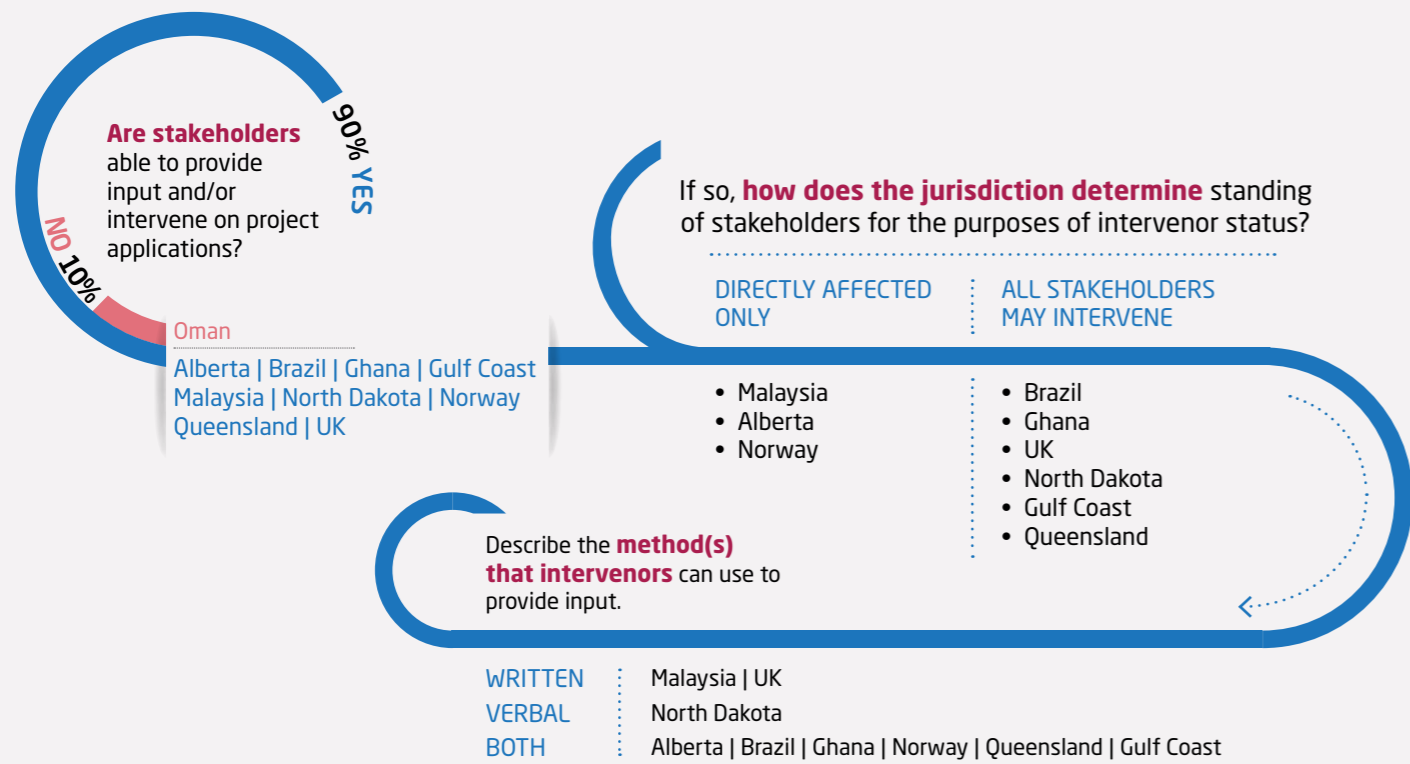
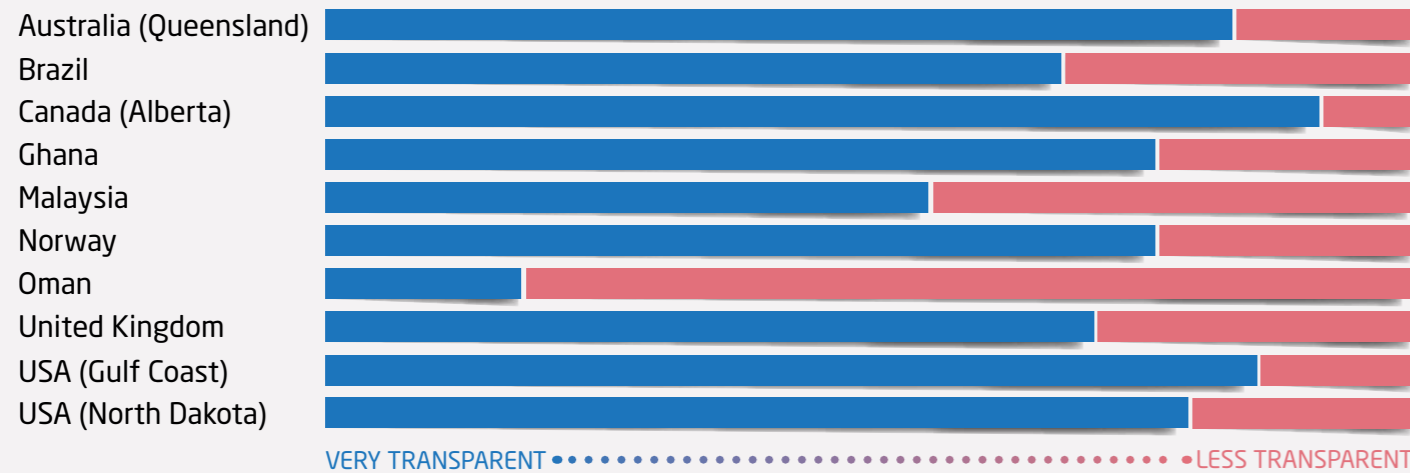
Key differentiators between countries for compliance included: whether the government publishes a list of regulatory infractions/non-compliance events/fines and penalties; whether long-term monitoring is required past the end-of-life of the facility; and the types of mechanisms that are in place to ensure that conditions stipulated in the regulatory approvals followed.



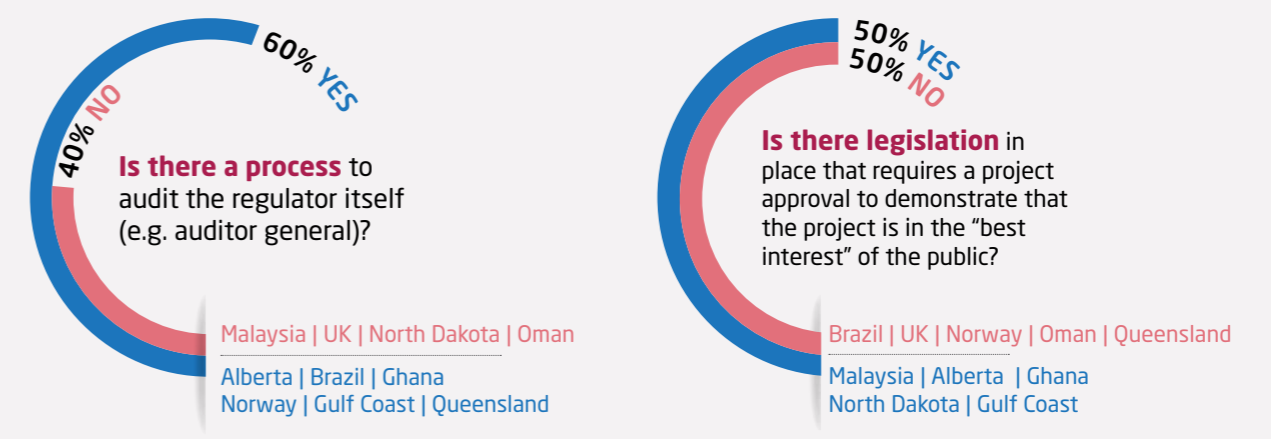
It is important to note, particularly with compliance measures, that the survey was meant to evaluate the systems, processes and controls that exist within the evaluated jurisdictions and not how effectively and efficiently the jurisdictions are operating.

How easily can the public get information?

TRANSPARENCY RESULTS



TWO QUESTIONS RELATING TO TRANSPARENCY

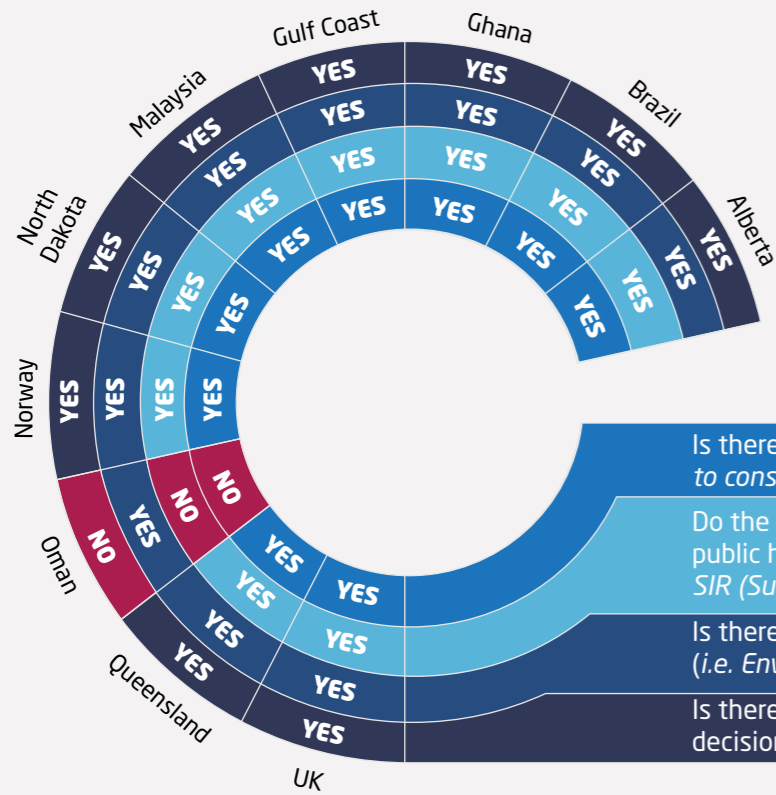


Some key differentiators between countries included: the level of detail provided from monitoring reports to the general public; the frequency and type of regulatory auditing processes; if the government reports on facility decommissioning and reclamation; and whether an orphan well/ orphan facility program publicly reports activities, progress and financial information.



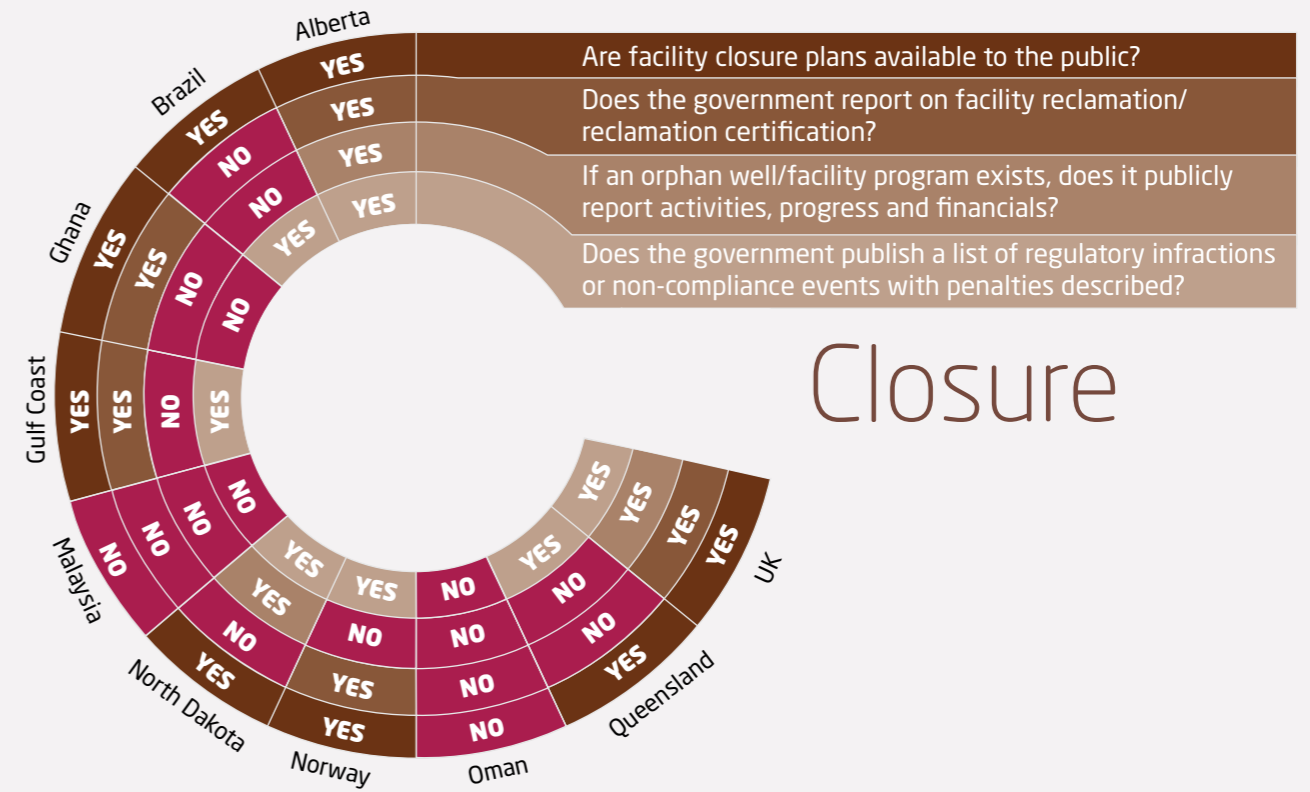
Questions related to project life cycle

Some of the questions that show the difference between countries in terms of approvals, operations and closure are provided on these pages. Regional experts answered the questions in the context of major hydrocarbon projects.



Approvals

- Is there any type of duty to consult in legislation? e.g. duty to consult "affected parties", or indigenous people(s)?
- Do the due process requirements include processes for public hearings and/or information requests? (e.g. Hearings, SIR (Supplemental Information Requests), Intervention)
- Is there a public appeal process for regulatory decisions? (i.e. Environmental Appeal Board)
- Is there a project proponent appeal process for regulatory decisions?

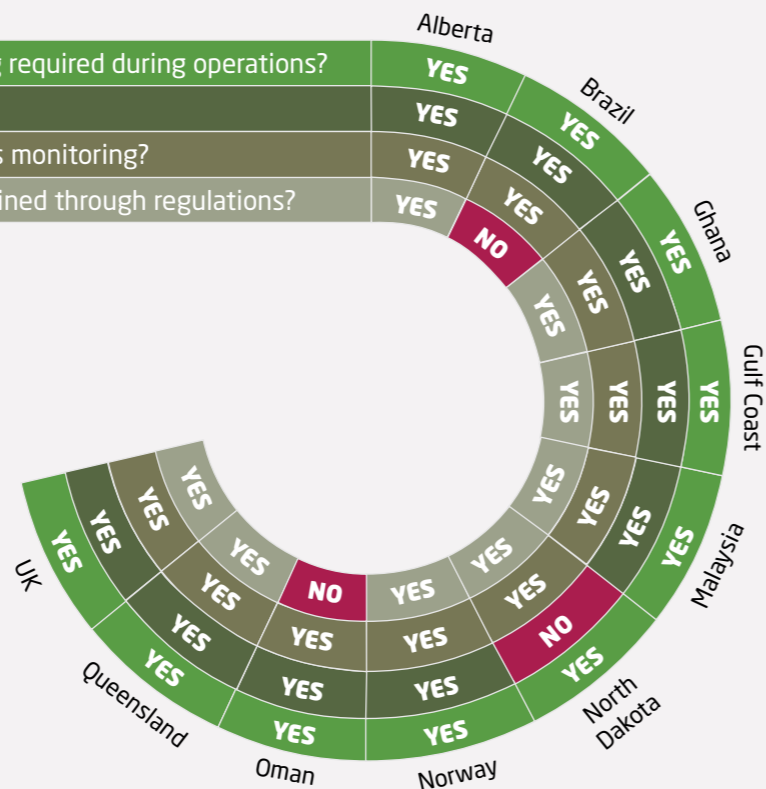


Closure

- Are facility closure plans available to the public?
- Does the government report on facility reclamation/reclamation certification?
- If an orphan well/facility program exists, does it publicly report activities, progress and financials?
- Does the government publish a list of regulatory infractions or non-compliance events with penalties described?

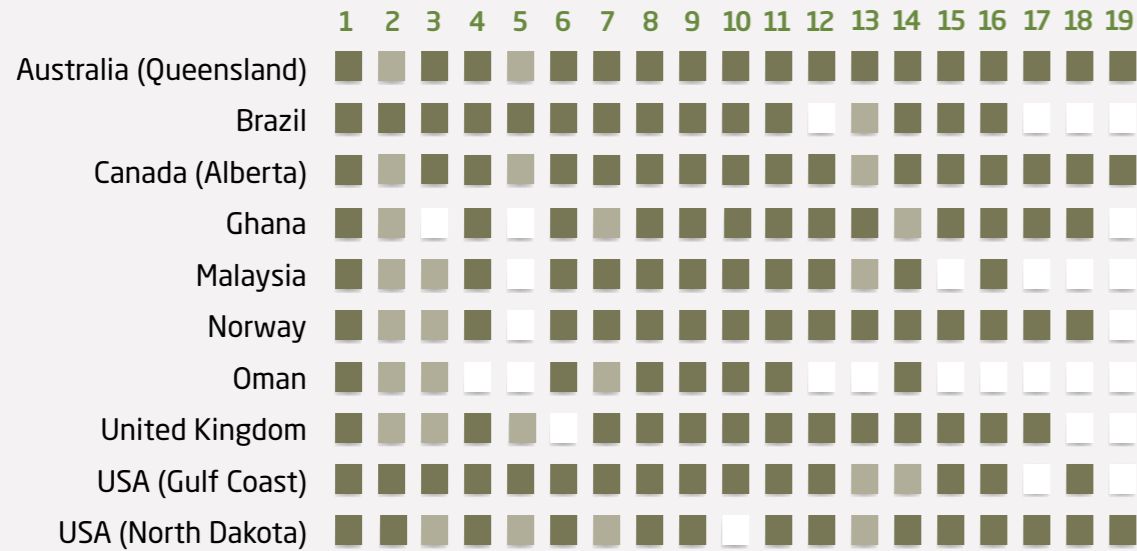
- Is environmental monitoring and reporting required during operations?
- Are cumulative effects monitored?
- Are there any requirements for continuous monitoring?
- Are monitoring criteria and thresholds defined through regulations?

Operations



Survey Results Summary

SURVEY RESULTS - STRINGENCY



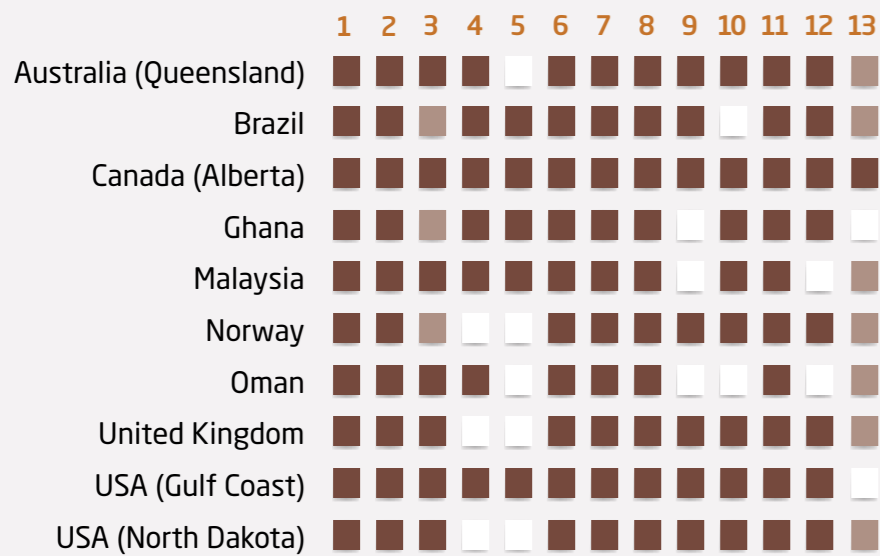
LEGEND

YES / HIGH

PARTLY / MEDIUM

NO / LOW

SURVEY RESULTS - COMPLIANCE



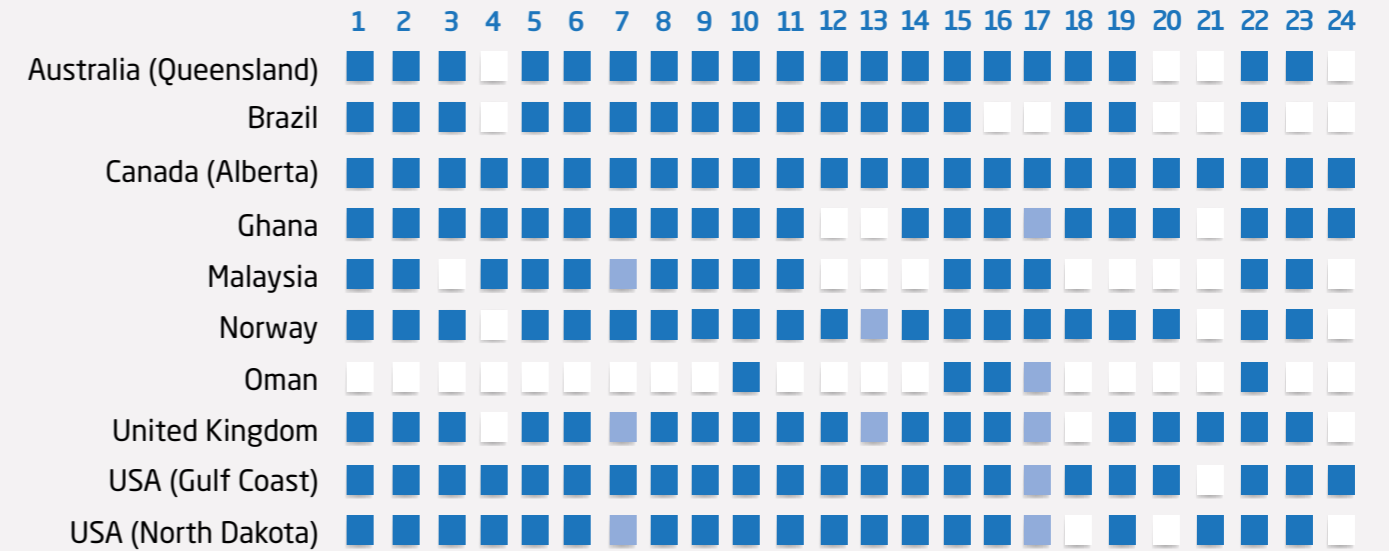
LEGEND

YES / HIGH

PARTLY / MEDIUM

NO / LOW

SURVEY RESULTS - TRANSPARENCY



LEGEND

YES / HIGH

PARTLY / MEDIUM

NO / LOW

*Survey results reflect Stringency, Compliance, and Transparency questions listed on pages 10 - 11.



For more detailed information please visit <http://www.capp.ca/library/third-party-reports/>

Alberta in Perspective

Projects in Alberta requiring government approval may be reviewed at both a provincial and federal level. When a proposed project is required to undergo both a provincial and federal environmental impact assessment (EIA), the two governments cooperate to minimize overlap. The EIA may be examined by numerous agencies. On average, approximately 10 major project applications requiring an EIA are reviewed by each regulator in a year.

During the application process, Aboriginal Peoples and stakeholders are given opportunity to voice concerns and file objections to which the project executors must adequately respond. The public can be involved in the EIA process as early as the release of the Terms of Reference for the project. Copies of all public comments are made public through the Alberta Environment website. During the operational phase of Alberta projects, the projects are mandated through legislation to operate within the best interest of the public, and members of the public are able to provide input into legislation. Of particular note is the First Nations Consultation Plan which requires engagement with Alberta's indigenous people whose rights and traditional use of the land may be adversely affected.

Continuous monitoring of water and air emissions is common in Alberta. Routine inspections and audits take place and non-compliance events are tracked and reported by the government. Regulatory non-compliance under Alberta legislation could result in stop work orders, financial penalties, community service, suspensions and/or cancellation of permits. The details of regulatory infractions are made available to the public.

Alberta legislation requires that closure plans be submitted during a project application and bond or financial security against end-of-life facility liability is also required. The closure process is transparent with closure plans available to the public and remediation and reclamation efforts reported to stakeholders. Once ecological trends are achieved, a company can apply for reclamation certification.



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