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# MALAYSIAN CCS LEGAL AND REGULATORY WORKSHOP

## **WORKSHOP REPORT**

Lumut, Malaysia, 27 February – 1 March 2013

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## Executive Summary

Acknowledging the critical importance of carbon capture and storage (CCS) to delivering significant emission cuts in fossil fuel-based emissions, the Malaysian Government, led by the Ministry of Energy, Green Technology and Water (KeTTHA), has partnered with the Global CCS Institute to develop and implement the Malaysian CCS Capacity Development Program. The aim is to help Malaysian stakeholders develop awareness, understanding, knowledge and, ultimately, skills around different aspects of CCS to ensure Malaysia is well positioned to capitalise on the technology in the future.

An important initiative under the Program involves stakeholders developing an understanding of legal and regulatory issues as they relate to the Malaysian context. Accordingly, the *CCS Legal and Regulatory Framework Workshop* was held in Lumut, Malaysia, on 28 February–1 March 2013. The workshop aimed to identify how a CCS project would be regulated under existing regulatory pathways in Malaysia. The analysis will help to identify regulatory gaps, overlaps, and areas to be improved for a potential CCS project to go ahead in Malaysia in the future. The workshop focused on identifying issues for, and suggesting approaches to, further discussion.

More than 40 government, industry, academic and non-government organisation (NGO) representatives from Malaysia participated in the one-and-a-half day discussion-based workshop. The key themes that emerged from discussions about capture, transport, storage and cross-cutting issues, are summarised below.

- There is no definition of carbon dioxide (CO<sub>2</sub>) within Malaysia's regulatory framework.
- It is not clear which Malaysian regulatory agency would regulate the capture, transport or storage components of the process. It is likely that several agencies would have a role to play in regulating different components of the CCS chain, necessitating coordination mechanisms such as a lead agency to act as a 'one-stop-shop' or a steering group approach for a specific project.
- Dedicated legislation could be developed specifically for the whole CCS chain and applied to all relevant CCS sectors.
- Standards would need to be developed or adopted for CO<sub>2</sub> capture; CO<sub>2</sub> pipeline specifications; site characterisation and selection; and monitoring, measurement and verification.
- Occupational health and safety issues would need to be managed across the whole CCS chain.
- A liability regime would need to be developed to delineate ownership and liability for all components of the CCS chain.
- Public engagement and raising awareness of the technology would be crucial; both the land acquisition requirements and environment impact assessment process could be important mechanisms to realise this objective.
- Coordinating regulation and management across state and international boundaries will be challenging and important.

## Next steps

The issues and suggestions raised at the workshop provide a solid foundation for further analysis that may be beneficial in underpinning a second workshop or forum to progress the issues. Based on the workshop feedback, the following next steps are suggested:

1. Analysis of the effect of defining CO<sub>2</sub> as a waste, pollutant, resource or greenhouse gas under Malaysia's existing regulatory framework, to encourage further discussion on defining CO<sub>2</sub> for the purposes of a CCS project.
2. Analysis of all relevant Malaysian regulators and agencies to identify:
  - their potential role in any component of the CCS chain (capture, transport or storage)
  - relevant existing expertise (e.g. geological expertise, experience with pipelines, chemical engineering expertise)
  - an existing or potential role managing transboundary relationships
  - based on the above, identify options or suggestions regarding potential agency leads for capture, transport, storage and transboundary relationships.
3. With consideration of the above, comparison of issues between regulating CCS through dedicated CCS legislation and regulating capture, transport and storage within the existing framework (with relevant coordination mechanisms). Issues of comparison between the two models may include, but are not limited to: cost, efficiency, and ability to implement.

## Background

Approximately 81 per cent of the world's energy is derived from the use of fossil fuels,<sup>1</sup> accounting for about 61 per cent of total anthropogenic greenhouse gas (GHG) emissions. Industrial processes account for a further five per cent of global GHG emissions.<sup>2</sup> Increased use of renewable energy, greater energy efficiency and nuclear power all have essential roles to play in the mitigation of GHG from energy production and energy-intensive industries. However, fossil fuels will continue to be an important energy source for the next 50+years, including in Malaysia.

Carbon capture and storage (CCS) is the only technology available to deliver significant emissions reductions from fossil fuels, making it a critical technology to achieve global emissions reduction targets. The International Energy Agency (IEA) estimates that CCS could contribute up to 17 per cent of the total global mitigation that is needed to halve global GHG emissions in 2050.<sup>3</sup>

At the United Nations Framework Convention on Climate Change (UNFCCC) Conference of the Parties (COP) held in Copenhagen in 2009, Malaysian Prime Minister Dato' Sri Mohd Najib Tun Abdul Razak announced Malaysia would aim to reduce its emissions intensity of gross domestic product by 40 per cent by the year 2020 compared to 2005 levels. This target is conditional upon receiving transfer of technology and finance from Annex I countries. The Ministry of Natural Resources and Environment is leading the development of a national roadmap aimed at meeting this target.

Given the critical importance of CCS in delivering significant emission cuts, the Malaysian Government, led by the Ministry of Energy, Green Technology and Water (KeTTHA), partnered with the Global CCS Institute and the Clinton Climate Initiative to conduct a Malaysian CCS scoping study. This was delivered to the Minister of Energy in January 2011. The study concluded that, 'Malaysia is well positioned to develop a strategy that includes CCS in its future energy supply and infrastructure and there is a strong rationale for doing so'.

KeTTHA then partnered with the Global CCS Institute to undertake a capacity assessment and, based on the assessment, develop the tailored Malaysian CCS Capacity Development Program (the Program). The aim of the Program is to help Malaysian stakeholders develop awareness, understanding, knowledge and, ultimately, skills in different components of CCS to ensure Malaysia is well positioned to capitalise on the technology in the future. Several capacity development initiatives have been implemented over the past two years as part of the Program.

An important initiative of the Program involves identifying and understanding legal and regulatory issues as they relate to the Malaysian context. Accordingly, the *CCS Legal and Regulatory Framework Workshop* was held in Lumut, Malaysia, on 28 February–1 March 2013. The workshop aimed to identify how a potential CCS project would be regulated under the existing regulatory framework in Malaysia. The analysis will help to identify regulatory gaps, overlaps, and areas to be improved for a potential CCS project in Malaysia in the future. The focus of the workshop was on identifying issues and suggested approaches as a way to further the discussion.

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<sup>1</sup> IEA, 2011, *World Energy Outlook 2011*. [ONLINE] Available at <<http://www.iea.org/weo/>> [Accessed 29 April 2013]

<sup>2</sup> IEA, 2012, *Energy Technology Perspectives: Emissions Reductions*, <<http://www.iea.org/etp/explore/>> [Accessed 29 April 2013]

<sup>3</sup> IEA, 2011, *op cit*

## Workshop planning

Planning for the workshop began in October 2012 with a meeting of Global CCS Institute staff and KeTTHA project coordinators, followed by a broader meeting with key Malaysian government and industry stakeholders. The aim was to introduce the concept of the workshop to stakeholders and provide them an opportunity to ask questions, provide feedback or make suggestions about the workshop scope.

### Steering Group

A Steering Group was established comprising interested industry and government organisations who attended the initial stakeholder meeting in October. A Steering Group meeting was held in December 2012; the Global CCS Institute participated via teleconference. Workshop logistics discussed included the agenda; the role of facilitators (both the Master facilitator and group facilitators); proposed facilitators; and the development of a legal and regulatory matrix.

### Legal and regulatory matrix

It was decided that a matrix of the regulations, permits, approvals, licences and certificates etc that may apply to a potential CCS project under Malaysia's current legal and regulatory framework would provide a rich context for discussion at the workshop.

Following an expression of interest process in December 2012, Baker & McKenzie and their Malaysian partners, Wong & Partners, were contracted to develop the matrix. They were selected on the basis of: expertise in CCS, expertise in prescribed areas of Malaysian law, and opportunity to build CCS capability in a Malaysian firm.

Similar to CCS permitting matrices developed for [Scotland](#), [Romania](#), and [Trinidad and Tobago](#), the matrix was divided into the three components of the CCS chain – capture, transport and storage. Each of these components was divided into phases: a) design and construction; b) operation; c) decommissioning; and, in the case of storage, d) post-decommissioning. A draft was provided to the Steering Group in January 2013 and, following some amendments, to workshop participants in mid-February 2013 for review and preparation before the workshop.

Final amendments were made as a result of feedback from the workshop, drawing on the participants' on-the-ground experience. The matrix is provided in **Appendix I**. However, this should be considered a 'living' document; it was acknowledged at the workshop that the matrix could be further refined by examining state and territory laws and laws applying to offshore projects, such as those in the Exclusive Economic Zone. Nevertheless, the matrix provides a good general summary of federal laws that may apply to CCS under the existing regulatory framework. However, a more targeted analysis of applicable laws and identification of gaps would depend on what CCS policies or projects were implemented in the future.

## Workshop structure

The one-and-a-half day workshop was held in Lumut, outside of Kuala Lumpur, to ensure participants' commitment to it and to minimise distractions. This location also enabled a site visit to the Janamanjung Power Plant, which provided a good introduction to CCS. **Appendix II** is the final agenda of the workshop.

In the weeks leading up to the workshop, presenters were provided with speaker notes outlining their role in the workshop, and suggestions about the scope of their presentation and, importantly, advised that the workshop would be conducted under the Chatham House Rule i.e. comments made at the workshop may be reported but not attributed to a particular individual or organisation. This approach was adopted to promote open discussion and exploration of issues and options among participants. This approach was reinforced by the Chair and the Master Facilitator at the beginning of the workshop to encourage a frank discussion.

The first morning of the workshop was used to contextualise the topic, provide an overview of CCS, and describe legal and regulatory developments internationally. It provided an important opportunity for participants to share knowledge and raise awareness and understanding about issues encountered and approaches adopted by other jurisdictions. It also provided an opportunity to raise concerns and questions about the technology – for example, as in many jurisdictions, concerns about cost and the ‘energy penalty’<sup>4</sup> was raised. As the agenda shows, the permitting matrix provided a basis to focus the discussion within the Malaysian context.

The rest of the workshop comprised discussion sessions on capture, transport, storage, and cross-cutting issues. The capture, transport and storage sessions started with one or two short presentations to help set the scene and identify potential topics for further discussion. This included a short presentation on legal and regulatory issues pertaining to the session topic that other jurisdictions have encountered. The capture session also included a presentation by a relevant Malaysian authority on the existing regime.

Following these introductory presentations the Master Facilitator then divided participants into three discussion groups of about 15 people each. Group facilitators (two from the Global CCS Institute and one from Baker & McKenzie) encouraged discussion to elicit from each group what they considered to be the key issues. Groups were encouraged to identify key gaps, overlaps, areas for improvement or opportunities to streamline the different components of CCS, as well as to suggest solutions to problems. A scribe recorded the groups’ thoughts using a feedback form, which can be found at **Appendix III**. At the end of each discussion session, the three groups came back together and a spokesperson from each summarised the key themes or issues identified by their group.

The final session, on cross-cutting issues, was structured differently. It involved a panel discussion and an interactive discussion with the audience.

## Workshop participants

Participants in the workshop included the Master Facilitator from Renmin University, Global CCS Institute staff, representatives from Baker & McKenzie and Wong & Partners, and about 40 Malaysian stakeholders from:

- government (KeTTHA; Ministry of Science, Technology and Innovation; Ministry of Natural Resources and Environment, including the Department of Environment; Energy Commission; and the Economic Planning Unit)
- industry (TNB, PETRONAS; Kapar Energy; and Jimah O & M Sd N.BHD)
- academia (University Tenaga Nasional, Universiti Teknologi Petronas)
- NGO (Ensearch).

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<sup>4</sup> The capture and compression phase of CCS requires a lot of energy. In fact, it can take in the order of 20 per cent of a power station’s energy production to capture and compress up to 90 per cent of the CO<sub>2</sub> produced by the power station. This has become known as the ‘energy penalty’ and can account for 60–85 per cent of the cost of CCS.

## Issues identified

The workshop focused on identifying issues and proposing approaches to address those issues as a way to further the discussion. The key issues and suggestions that emerged from facilitated discussions are summarised below, without attribution to any specific organisation or individual (Chatham House Rule).

### Capture

The first presentation, by Tenaga Nasional Berhad, focused on the permits and approvals currently required for a power plant. This was followed by a Baker & McKenzie/Wong & Partners presentation that highlighted some of the key issues considered by other jurisdictions when developing capture legislation or regulation. It covered, for instance: identification of applicable capture technologies; classification or definition of CO<sub>2</sub>; understanding existing planning requirements; capture ready requirements for new power plants; carbon pricing as an incentive; reporting requirements for captured CO<sub>2</sub>; and cost considerations (especially of retro-fitting and energy penalty).

The groups identified the following as key issues for capture:

- **No definition of CO<sub>2</sub>:** there is currently no definition of CO<sub>2</sub> within Malaysian law; CO<sub>2</sub> is not defined as a pollutant, contaminant, natural resource or greenhouse gas. Many stakeholders believe that defining CO<sub>2</sub> would be an important first step for CCS because it would likely have an impact on other applicable legislation which would influence the best way to regulate CCS within Malaysia.
- **Not clear which agency would regulate capture:** CCS is a relevant mitigation technology for the power, oil and gas, cement, fertiliser, and steel sectors, which makes it difficult to regulate through legislation specific to a particular sector – e.g. the power sector. It is also difficult, therefore, to identify a regulatory agency within the existing Malaysian framework that would, logically, be responsible for issuing permits and ensuring compliance with capture standards.
- **Need to develop capture standards:** there will be a need to identify and develop relevant standards for CO<sub>2</sub> capture within power and industrial facilities, for example on the purity of the CO<sub>2</sub> stream. It was noted that Malaysia could draw on the standards developed from other jurisdictions and, in time, on the international standards being developed through the International Organization for Standardization, which is in the early stages of drafting.
- **Need to link CCS to broader climate change policy:** several stakeholders raised the need to link CCS to a broader greenhouse gas emissions reduction policy, such as a price on carbon, or a more specific CCS policy to help achieve emissions reduction targets. Given the expense of CCS, many thought that operators would not implement CCS unless it was a government mandate.
- **Need to adapt Environmental Impact Assessment (EIA) for CCS:** the EIA requirements would need to be adapted to specifically take into account the impact of CO<sub>2</sub> capture on the environment (as well as the other parts of the CCS chain). It was acknowledged that the EIA process was a very important vehicle for engaging the public.
- **CCS ready:** given Malaysia has plans for additional coal-fired power plants in the near future, some participants advocated for CCS ready requirements to be considered.

Suggestion/s:

**One-stop-shop agency coordination:** given the different industry sectors to which CCS could apply, and the complexity of different issues even within an industry, it was suggested that a good way to coordinate regulation of capture specifically – and CCS more broadly – would be to identify a lead agency to act as the one-stop-shop for industry, and who would coordinate internally with other relevant agencies to issue relevant permits.



## Transport

The introductory Global CCS Institute presentation focused on legal and regulatory issues that relate to transport, including: health and safety issues; composition of CO<sub>2</sub> stream; transboundary movement of CO<sub>2</sub>; liability in the event of a CO<sub>2</sub> release during transportation; pipeline route/corridor requirements and acquisition of rights of way; accounting for fugitive emissions in a project's emission inventory; and third-party access to CO<sub>2</sub> transportation networks. For the purposes of discussion, unless otherwise stated, it was considered that transport would be via pipelines.

The groups identified the following as key issues for transport:

- **Not clear which agency would regulate CO<sub>2</sub> pipelines:** while raised in relation to capture, discussion of this issue in relation to the transportation of CO<sub>2</sub> was much more active. Malaysia's existing gas pipeline regulations are regulated by the Energy Commission (EC), so the EC may be one potential regulatory candidate with existing pipeline expertise. However, the EC's mandate is energy and energy-related issues, and CO<sub>2</sub> is not energy-related (except potentially as a by-product of a power-plant).
- Other agencies that were identified as potential regulatory candidates included: Ministry of Natural Resources and Environment, based on its stewardship of emissions reduction policy; Ministry of Science, Technology and Innovation, given CCS is an innovative technology; Department of Occupational Health and Safety (OH&S), since OH&S may be the major risk requiring regulation; and PETRONAS, to regulate any offshore pipelines. It is also possible that different components of the CCS chain could be regulated by different organisations. For example, the Department of OH&S would regulate risks associated with OH&S; Department of Environment, compliance with design standards on the basis that design standards are there to mitigate environmental impact; etc.
- **Need for consistency in interstate regulations for transport:** it is possible that CO<sub>2</sub> pipelines for a CCS project would cross state boundaries, which would require any state-based regulations regarding CO<sub>2</sub> pipelines to be consistent. Cross-boundary pipelines may also involve multiple regulatory agencies in the different states, which would also need to be coordinated.
- **Need to develop transport standards:** the current design standards for pipelines in Malaysia are developed for hydrocarbons, which may not be suitable for CO<sub>2</sub> transportation. Therefore, new standards may need to be developed or adopted by Standards Malaysia. Transportation of CO<sub>2</sub> by ship would require additional dedicated standards.
- **OH&S standards:** the discussion of OH&S standards highlighted some uncertainty about the potential risks of CO<sub>2</sub>, which is not toxic and generally not dangerous. Nevertheless, potential hazards, such as leaks, require risk management consideration and should be addressed through design standards.
- **Ownership and liability:** ownership of CO<sub>2</sub> pipelines and, therefore, liability for any leakage at the transport stage would need to be clearly established.
- **Land acquisition:** Malaysia has land acquisition legislation that may be applicable in the event that land must be acquired for pipelines (refer to Legal and Regulatory Matrix in Appendix I). Land acquisition requirements highlight the importance and challenge of public awareness and communicating to the broader community the national interest aspect of CCS. Workshop participants noted that many CO<sub>2</sub> pipelines would most likely follow the easements of gas pipelines, given that gas pipes are already connected to large CO<sub>2</sub> point sources. This would greatly reduce the land acquisition requirements (since the land is already acquired) and minimise further effects.

Suggestions:

- **Leading agency to coordinate:** this suggestion was also made in relation to capture i.e. that one agency should coordinate approvals and regulation, engage with industry and liaise with other relevant agencies as needed.
- **Dedicated CCS legislation:** legislation could be developed specifically for the whole CCS chain and applied to all relevant CCS sectors. The legislation could be entirely administered by a specific agency, or different agencies could regulate different components of the CCS chain.

## Storage

The introductory Global CCS Institute presentation on the storage component of the CCS chain drew on examples from regulatory models already in force, including: site selection and characterisation of potential storage sites; the requirement for corrective measures and remediation in the event of leakage and/or other damage; and liability – the roles and responsibilities of the operator and competent authorities during the operational, closure and post-closure phases.

The groups identified the following as key issues for storage:

- **Need to identify suitable storage sites:** a storage scoping study is required to identify whether Malaysia has any suitable storage sites onshore and/or offshore. The challenge is that there is currently no incentive to identify potential sites, especially given this can be expensive.
- **Liability:** a leakage liability regime would need to be established, not only for storage, but for all the stages of a CCS project.
- In some CCS-specific legislation in other jurisdictions, the State assumes liability for the site (and therefore any leakage) after a suitable post-closure period. An interesting consideration that may not be applicable in other jurisdictions is contained in Malaysia's *Limitations Act 1953*. This Act requires that any civil action be taken within six years of a proposed offense/act. Given this is well within the usual post-closure period for a CCS project, this legislation may mitigate the risk of the State taking over liability from an operator.
- Participants also noted that if CCS projects were implemented by government-owned entities, the need for a transfer of liability may be negated.
- **Not clear which agency would regulate storage:** as with the capture and transport components, it was not clear which agency in Malaysia would be responsible for regulating the storage of CO<sub>2</sub>. For storage, it was even less clear who would be the potential regulatory candidates.
- Participants noted that the Geoscience Department would be important in helping to identify and possibly assess storage sites and projects, but it is not currently a regulator. With the exception of PETRONAS, no other agency with geological expertise was identified. PETRONAS would presumably regulate any offshore projects or, with suitable checks and balances, projects implemented by them.
- However, other organisations were identified as possibly having a role to play, or an interest in, the selection and use of a storage site. The Department of Environment would likely be involved in assessing the EIA and any monitoring, measurement and verification plans, as would the Department of OH&S. The Ministry of Natural Resources and Environment may also be relevant, together with the Economic Planning Unit (EPU), Land Office, and perhaps even state authorities, depending on the storage location.
- **Need to develop storage standards:** standards should be developed for site characterisation and selection during the development phases, as well as for monitoring, measurement and verification during the operational phase. Closure and post-closure requirements would also need to be developed.

Suggestion:

- **Steering committee:** once again the groups recognised the need for coordination between the various agencies that may have a role to play in the permitting and oversight of a storage site. This time, a Steering Committee approach was suggested as a way to coordinate the agencies. The Steering Committee, or Project Committee, would be formed with all relevant agencies to ensure cross-cutting issues were discussed and the best way to proceed agreed. One agency would need to chair the committee, such as the EPU – given it submits advice to the Economic Council and Prime Minister on projects of national importance.

## Cross-cutting issues

This session was opened by the Master Facilitator with a presentation on some of the cross-cutting issues that may be relevant to Malaysia. This included: biomass and its potential for negative emissions, related land use challenges and potential positive impact on cost; incentivising CCS as part of a climate change mitigation strategy (through a carbon price, tax or other policies); international treaties and engagements (e.g. although Malaysia is not a party to the London Convention and Protocol, neighbouring countries may be); how ASEAN is treating environmental resources; the impact bilateral treaties may have on issues such as pipeline networks and storage locations; and third-party access to storage and transport infrastructure.

The following key issues emerged from the panel and floor discussions:

- **International coordination:** international coordination would become a consideration if suitable storage was found in the joint development area with Thailand or near boundaries with neighbouring countries.
- **Funding for CCS:** funding for CCS demonstration projects is needed in both developed and developing countries. Technology transfer is also essential.
- **Incentives:** incentives for CCS in Malaysia may include research and development (R&D) grants. R&D more broadly is already encouraged and incentivised, primarily through the Ministry of Science, Technology and Innovation.
- **CO<sub>2</sub> utilisation:** this is of interest to Malaysia, especially through the link with bio-energy and also, potentially, pharmaceutical industries.
- **Public acceptance:** thought should be given to the best way to raise awareness of the technology and, critically, gain public acceptance for it. Consumers may be reticent to pay higher prices for electricity, but the impact of climate change on the economy in the future will have more significant consequences. This is an important but difficult message to communicate.

## Next steps

The workshop provided a forum for participating Malaysian stakeholders to identify what they consider are the key issues, regulatory gaps, overlaps and areas for improvement to permit and regulate a potential CCS project in Malaysia in the future. Perhaps the single most important issue to emerge was the critical gaps in Malaysia's current regulatory framework that would need to be addressed to regulate a CCS project. In particular, it was not clear which agency/agencies - under which legislation - would logically take the lead in regulating any part of the CCS chain – capture, transport or storage. The classification of CO<sub>2</sub> was also repeatedly raised as an important policy and regulatory issue.

The issues and suggestions raised at the workshop provide a solid foundation for further analysis that may be beneficial in underpinning a second workshop or forum to progress the issues. It should be noted that the following suggestions are provided in the context of furthering discussion, as there is currently no CCS policy mandate in Malaysia. Nevertheless, based upon the workshop feedback, the following next steps are suggested:

1. Analysis of the effect of defining CO<sub>2</sub> as a waste, pollutant, resource or greenhouse gas under Malaysia's existing regulatory framework, to encourage further discussion on defining CO<sub>2</sub> for the purposes of a CCS project.
2. Analysis of all relevant Malaysian regulators and agencies to identify:
  - their potential role in any component of the CCS chain (capture, transport or storage)
  - relevant existing expertise (e.g. geological expertise, experience with pipelines, chemical engineering expertise)
  - an existing or potential role managing transboundary relationships
  - based on the above, identify options or suggestions regarding potential agency leads for capture, transport, storage and transboundary relationships.
3. With consideration of the above, comparison of issues between regulating CCS through dedicated CCS legislation and regulating capture, transport and storage within the existing framework (with relevant coordination mechanisms). Issues of comparison between the two models may include, but are not limited to: cost, efficiency, and ability to implement.

## Abbreviations and acronyms

ASEAN	Association of South East Asian Nations
CCS	carbon capture and storage
CO <sub>2</sub>	carbon dioxide
COP	Conference of the Parties
EIA	Environmental Impact Assessment
EC	Energy Commission
EPU	Economic Planning Unit
GHG	greenhouse gas
IEA	International Energy Agency
KeTTHA	Ministry of Energy, Green Technology and Water
NGO	non-government organisation
OH&S	Occupational Health and Safety
R&D	research and development
UNFCCC	United Nations Framework Convention on Climate Change

## APPENDIX I: Permitting Matrix as pertains to Carbon Capture and Storage in Malaysia

TABLE 1.1: CAPTURE - DESIGN AND CONSTRUCTION

TABLE 1.2: CAPTURE – OPERATION

TABLE 1.3: CAPTURE – DECOMMISSIONING

TABLE 2.1: TRANSPORT - DESIGN AND CONSTRUCTION

TABLE 2.2: TRANSPORT - OPERATION

TABLE 2.3: TRANSPORT - DECOMMISSIONING

TABLE 3.1: STORAGE - DESIGN AND CONSTRUCTION

TABLE 3.2: STORAGE - OPERATION (INJECTION)

TABLE 3.3: STORAGE - DECOMMISSIONING

TABLE 3.4: STORAGE - POST-DECOMMISSIONING

**TABLE 1.1: CAPTURE - DESIGN AND CONSTRUCTION**

Issue	Area covered	Legal provisions	Competent authority	Permitting Timeline	Existing Regulatory Framework	Potential legislative amendment/Comment
1.1 A (i) New power plant - development approval process	Design and construction - construction and planning	<p>What are the key sections of the relevant act?</p> <p>Energy Supply Act 1990 (Section 9)</p>	<p>Who makes the decision?</p> <p>Energy Commission ("EC"); Minister of Energy, Green Technology and Water</p>	<p><b>Bidding process:</b> Around 6 months</p> <p><b>IPP Licence:</b> 60 days from award of project</p>	<p><i>Is there an integrated development approval process? How is the approval gained? Is an environmental impact statement required?</i></p> <p><b>New Power Plant</b></p> <p>New power plants are subject to a competitive bidding process. Once the project has been awarded, the successful bidder needs to apply for a Power Generation Licence from the EC.</p> <p>The grant of a Power Generation Licence ("<b>Licence</b>") for independent power generators will only be approved for a period of up to 21 years (renewable). Based on the Guidelines on Licensing of Power Generation issued by EC, the application for the Licence must be submitted to the Licensing Unit, Electricity Supply Regulatory Department ("<b>JKPE</b>") of EC and will involve the following steps:</p> <p>(a) Upon receipt of the prescribed application form, the Licensing Unit will assess the application to ensure that it fulfils the requirements imposed;</p> <p>(b) The Licensing Unit will then prepare the documents and submit the application to the Director of JKPE, before submitting it to the Licensing Committee for approval;</p> <p>(c) Upon approval by the Licensing Committee, the Licensing Unit will prepare the necessary memorandum for the approval of the Minister of Energy, Green Technology and Water;</p> <p>(d) Upon approval by the Minister, the Licence will be prepared for signature by the Chairman of EC. JKPE will collect the prescribed licensing fee before the issuance of the Licence;</p> <p>(e) Following the issuance of Licence, JKPE will monitor the progress of the project and impose necessary conditions on the Licence. An annual licensing fee will also be imposed.</p> <p>The following conditions must be satisfied for application for the Licence:</p> <p>(a) For a project which requires financing from banks, the applicant company must have paid-up capital of at least 2% of the total costs of the project or RM200,000 (whichever is higher);</p>	<p>The licensing regime for power plants in Malaysia is currently broad enough to cover construction of CCS-enabled power plants. However, the EC has the discretion to impose a condition in the IPP Licence that the power plant must be CCS-ready.</p>

Issue	Area covered	Legal provisions	Competent authority	Permitting Timeline	Existing Regulatory Framework	Potential legislative amendment/Comment
1.1 A (ii) New industrial facility - development approval process		Industrial Co-ordination Act 1975 & Rules ("ICA")	Ministry of International Trade & Industry ("MITI"); Malaysian Industrial Development Authority ("MIDA")	<b>Manufacturing Licence:</b> around 3 months	<p>(b) All designs, plans, drawings and specifications must be approved by suitably qualified and experienced engineer(s) registered as Professional Engineer(s) with the Board of Engineers, Malaysia (only a citizen or permanent resident of Malaysia qualifies for registration as a registered Professional Engineer);</p> <p>(c) The construction, installation, testing and commissioning of works must be supervised and approved by suitably qualified and experienced engineer(s) registered as Professional Engineer(s) with the Board of Engineers, Malaysia; and</p> <p>(d) The licensee shall at all times comply with the Government's policies particularly in relation to the Bumiputera equity condition.</p> <p>The IPP Licences are limited. The Energy Commission has recently invited bidders to bid for the development of a combined cycle gas turbine in Peninsula Malaysia, representing only the start of the fourth generation IPP.</p> <p>The current Bumiputera equity condition is that the applicant company must have at least 30% of Bumiputera shareholding and foreign participation is limited to a maximum of 25% of its share capital. But this condition may be varied on case by case basis.</p> <p>The approval of the Licence is also typically conditional upon the licensee entering into a fuel purchase agreement and power purchase agreement with the relevant parties.</p> <p><b>New Manufacturing Plant</b></p> <p>The application for a manufacturing licence in Malaysia is generally governed by the Industrial Co-ordination Act 1975 &amp; Rules ("ICA") and regulated by Ministry of International Trade &amp; Industry ("MITI") through its agency, Malaysian Industrial Development Authority ("MIDA"). Therefore, the application for manufacturing licence must be submitted and approved by MITI through MIDA.</p> <p>Section 3 of the ICA states that no person shall engage in any manufacturing activity unless he is issued a licence in respect of such manufacturing activity. However, this licensing requirement</p>	The manufacturing licence currently broad enough to cover industrial facilities with capture technology. There is only one type of licence. Thus no separate license or approval is required for cement or ammonia plants with CCS capture technology. However, the application will be processed by the relevant division in MIDA depending on the type of industry.



Issue	Area covered	Legal provisions	Competent authority	Permitting Timeline	Existing Regulatory Framework	Potential legislative amendment/Comment
		<p>Environmental Quality Act 1974 ("<b>EQA</b>"); Environmental Quality (Prescribed</p>	<p>Department of Environment ("<b>DOE</b>")</p>	<p><b>Preliminary EIA Approval:</b> 5 weeks (State DOE)</p>	<p>is only applicable to manufacturing company which have:</p> <p>(a) Shareholders' funds of RM2.5 million and above; <b>or</b></p> <p>(b) Engages 75 or more full time employees.</p> <p>The Government has lifted curbs on foreign participation in the manufacturing industry, including export and equity conditions, with effect from 17 June 2003. Under the new policy, 100% foreign equity will be allowed for all new investments and applicable to all manufacturing sector.</p> <p><b>"Manufacturing activity"</b> with its grammatical variations and cognate expressions for the purpose of the ICA means the making, altering, blending ornamenting, finishing or otherwise treating or adapting any article or substance with a view to its use, sale, transport, delivery or disposal and includes the assembly of parts and ship repairing but shall not include any activity normally associated with retail or wholesale trade.</p> <p>The government's guidelines for approval of industrial projects in Malaysia are based on the Capital Investment Per Employee (C/E) Ratio. Projects with a C/E Ratio of less than RM55,000 are categorised as labour-intensive and thus will not qualify for a manufacturing licence or for tax incentives. Nevertheless, a project will be exempted from the above guidelines if it fulfils one of the following criteria:</p> <p>(a) The value-added is 30% or more; (b) The Managerial, Technical and Supervisory (MTS) Index is 15% or more; (c) The project undertakes promoted activities or manufacture products as listed in the List of Promoted Activities and Products - High Technology Companies; or (d) Existing companies (formerly exempted) applying for a manufacturing licence.</p> <p>A licensed company which desires to expand its production capacity or diversify its product range by manufacturing additional products will need to apply to MIDA.</p> <p><b>Environmental Impact Assessment</b></p> <p>Under the EQA, any person intending to carry out any of the prescribed activities under the Prescribed Activities Order shall appoint a qualified person to conduct an environmental impact</p>	<p>The licensing regime for manufacturing plants in Malaysia is currently broad enough to cover construction of CCS-enabled manufacturing plants. However, MITI/MIDA has the discretion to impose</p>

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		Activities) Environmental Impact Assessment Order 1987		<b>Detailed EIA Approval:</b> 12 weeks (DOE HQ)	<p>assessment and submit a report to the Director General of the DOE in the prescribed form. Such report is also known as the Environmental Impact Assessment Report ("<b>EIA Report</b>"). If the Director General on examining the EIA Report is of the opinion that the report satisfies the requirements prescribed, the Director General shall approve the EIA Report, with or without conditions.</p> <p>The EIA Report shall contain an assessment of:</p> <ul style="list-style-type: none"> <li>(a) the impact such activity will have or is likely to have on the environment; and</li> <li>(b) the proposed measures that shall be undertaken to prevent, reduce or control the adverse impact on the environment.</li> </ul> <p>The construction of certain power plants (including steam generated power stations burning fossil fuels and having a capacity of more than 10 megawatts) is a prescribed activity (under Regulation 13 of the Environmental Quality (Prescribed Activities) Environmental Impact Assessment Order 1987 - this Order is not applicable for Sabah and Sarawak). As such, an EIA Report must be conducted and submitted to the DOE) for approval.</p> <p>Before conducting an EIA, a preliminary site assessment ("<b>PAT</b>") is required to be conducted to assess the suitability of the site, taking into consideration the category of land use, current government development policies, and existing land use etc. A prescribed form for PAT can be downloaded from DOE's website. Comments to the PAT issued by the State DOE will be attached in the EIA report.</p>	the necessary condition specific to CCS-ready plant.
1.1 B Land development approval	Design and construction - construction and planning	<p>What are the key sections of the relevant act?</p> <p>National Land Code (Section 124, 135-139, 140-145, 146-150); Town and Country Planning Act 1976; Land Acquisition Act 1960</p>	National Physical Planning Council; State Land Office; Local Planning Authority	<b>Application to vary conditions/amalgamation and etc. under NLC:</b> - 3 months to 18 months	<p><i>Are there any approvals required to develop land? Such as land clearing requirements?</i></p> <p>Town and Country Planning Act 1976 (only applicable in Peninsula Malaysia) defines "Property Development" as the carrying out of any building, engineering, mining, industrial or other similar operations in on, over or under land, or the making of any material change in the use of any buildings or other land, or the subdivision or amalgamation of lands.</p> <p>Therefore the construction or retrofit of a power generation facility or other manufacturing plant will also need to comply with the Act's provisions.</p>	

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				<p><b>Planning Approval:</b> Approximately 100 - 125 days (varies according to the local councils)</p>	<p><b>Category of Land Use</b></p> <p>The National Land Code ("<b>NLC</b>") does not deal with land development. The NLC however governs the classification of land use and the imposition of express and implied conditions on alienated land. As such, under the NLC, land development takes place in one or more of the following forms:-  (a) Variation of conditions, restrictions and categories (Section 124)  (b) Sub-division (Sections 135 – 139)  (c) Partition (Sections 140 – 145)  (d) Amalgamation (Sections 146 - 150)  (e) Simultaneous applications for sub-division and variation of conditions, restrictions and categories (Section 124A), and  (f) Surrender and re-alienation - special provisions (Sections 204A – 204H)</p> <p>All the above require prior approval from the State Authority.</p> <p><b>Planning Permission</b></p> <p>The State Authority is responsible for the general policy in respect of the planning of development and use of all lands and buildings within the area of every local authority in the State. Each local government authority acts as the planning authority for its own jurisdiction. No person shall carry out any development unless planning permission has been granted. An application must be made to the local planning authority in prescribed form with such documents, plans, development proposal report and fees as may be prescribed. If the applicant is not the owner of the land, written consent of the owner must be obtained and endorsed on the application. The development proposal report must contain:</p> <p>(a) development concept and justification;  (b) location map and a site plan;  (c) particulars of land ownership and restrictions;  (d) description of the land including its physical environment, topography, landscape, geology, contours, drainage, water bodies and catchments and natural features which may be affected by the development;  (e) a land use analysis and its effect on the adjoining land; and  (f) if specified by local planning authority, analysis of the social</p>	<p>"Alienated land" is land that is disposed by the State Authority for the payment of an annual rent, for a term not exceeding 99 years or in perpetuity where it is satisfied that the land is to be used for a public purpose, there are special circumstances rendering it appropriate to do so and where the Federal Government requires such a grant to be made by the State Authority to itself or another public body.</p>

Issue	Area covered	Legal provisions	Competent authority	Permitting Timeline	Existing Regulatory Framework	Potential legislative amendment/Comment
		Town and Country Planning Act 1976	Local Planning Authority; State Authority	<p><b>Licence to take forest produce:</b> 2 - 3 months depending on approval from the State Exco and the sensitivities of the location</p> <p><b>Licence to carry out activity on permanent reserved forest:</b> 2 - 3</p>	<p>implications of the development for the area.</p> <p>The planning permission may contain conditions such as prohibition of removal or alteration of any of the natural features of the land, compliance with tree preservation order (which may be issued if the local planning authority thinks it is expedient in the interest of amenity to preserve any tree) and etc.</p> <p><b>Land Acquisition</b></p> <p>The local planning authority may, by notification in the State Gazette, declare a certain area to be a development area. The local planning authority is obliged to acquire (by purchase or by compulsory acquisition under the Land Acquisition Act 1960), all alienated lands situated within the area, and to develop the area in accordance with the local plan.</p> <p>Under the Land Acquisition Act, the State Authority has the power to acquire land for themselves or for third parties when it is needed for a "public purpose", or beneficial to the "economic development" or for mining, commercial, industrial, agricultural or recreational purposes. Compensation is payable to the landowner for the acquired property. Application for such acquisition by the State Authority can be made to the Land Administrator appointed under State land law. The Land Administrator has to transmit the application to the State Economic Planning Unit or in the case of an application made in the Federal Territory of Kuala Lumpur, to the "Jawatankuasa Khas Pengambilan Tanah".</p> <p><b>Deforestation</b></p> <p>Under Town and Country Planning Act 1976, if it appears to the local planning authority that the preservation of any tree, trees or group of trees is in the interests of preserving the public amenities in its area, it may make a tree preservation order with respect to such tree, trees, or group of trees. A tree preservation order may, in particular, make provisions:</p> <p>(a) for prohibiting the felling of trees except with the written permission of and subject to any conditions imposed by the local planning authority; and</p> <p>(b) for securing the planting of trees or the replacement of trees by replanting in such a manner as may be determined by the local planning authority.</p>	<p><b>Land Acquisition</b></p> <p>The State can expressly recognise that construction of a CCS plant or storage site is needed for a "public purpose", and will be considered for land acquisition order if necessary.</p>

Issue	Area covered	Legal provisions	Competent authority	Permitting Timeline	Existing Regulatory Framework	Potential legislative amendment/Comment
		Street, Drainage and Building Act 1971 (" <b>SDBA</b> ") (Section 52, 55, 70); Uniform Building By-Laws 1984	Local Authority	months depending on approval from State Exco and the sensitivities of the location  <b>Permission to build:</b> 40 days	<p>Further, no person shall fell a tree with a girth exceeding 0.8 metres which is not subjected to a tree preservation order without written permission of local planning authority, unless the felling is in respect of a tree which is dying or dead, for prevention of an imminent danger or is to comply with any written law.</p> <p>For land within the permanent reserved forest area, if development is needed, the State Authority may still excise that land if it is no longer required for the purpose it is classified or if it is required for economic use higher than that for which it is being utilised. Apart from this, no person shall take any forest produce from a permanent reserved forest of State land, except with a licence. A licence to take forest produce or a permit to occupy or carry out any activity in a permanent reserved forest may be granted by the State Authority. But any buildings on the land will vest in the State Authority upon termination of the licence/permit.</p> <p>For other alienated land, mining land, reserved land or land held under a temporary occupation licence, removal of any forest produce requires a removal licence from the State Authority. A removal licence will only be issued to the owner of the land or in the case of mining land, the person to whom the mining lease or certificate has been granted, or, with his consent, to any other person.</p> <p>Royalty is payable to the State Authority for all forest produce taken at the rates laid down in Gazette.</p> <p><b>Construction of Drainage and Building Compliance</b></p> <p><u>(a) Erection of Building</u></p> <p>No person shall erect any building without the prior written permission of the local authority. A fine not exceeding RM50,000 or imprisonment for a term not exceeding 3 years or both shall be imposed upon conviction. For every day that the offence continues a further fine of RM1,000 shall also be imposed.</p> <p>"Building" includes any house, hut, shed or roofed enclosure, whether used for the purpose of a human habitation or otherwise, and also any wall, fence, platform, staging, gate, post, pillar, paling, frame, hoarding, slip, dock, wharf, pier, jetty, landing-stage or bridge, or any support structure or foundation connected to the foregoing.</p>	<p><b>Construction of Drainage and Building Compliance</b></p> <p>The licensing regime for erection of a building is currently broad enough to cover construction of a CCS-enabled power plant.</p>

Issue	Area covered	Legal provisions	Competent authority	Permitting Timeline	Existing Regulatory Framework	Potential legislative amendment/Comment
		Geological Survey Act 1974 (Section 5, 6, 7, 8, 13 and 14)	Director General of Geological Survey	<p><b>To obtain CCC:</b> Immediately upon completion of building and submission of the relevant form</p> <p><b>Construction of drainage:</b> Same application as the permission to build - 40 days</p> <p><b>Permit to commence earthworks:</b> 2 weeks</p>	<p>Certificate for Completion and Compliance ("<b>CCC</b>") is required under the Street, Drainage and Building Act 1971 to certify that a building has been completed and is safe for occupation. Any person who occupies or permits any building to be occupied without a CCC shall be liable on conviction to a fine of not more than RM250,000 or to an imprisonment for a term not exceeding 10 years or both.</p> <p><u>(b) Construction of Drainage</u> No person shall erect upon any premises any building, rebuild any building which has been pulled down to or below ground or occupy any building so newly-built or rebuilt unless surface or storm water drains, culverts, gutters and water-courses of such specification as may be prescribed by the local authority, are provided on such premises to carry off waters other than sewage.</p> <p><u>(c) Earthworks</u> No person shall commence or carry out or permit to be commenced or carried out any earthworks without having first submitted to the local authority plans and specifications in respect of the earthworks and obtained the approval of the local authority .</p> <p>Where the earthworks are to be commenced or carried out for the purpose of the construction of any building, street, drain, sewer, or embankment, or for the laying of any cable or pipe, or for the purpose of any other construction or work whatsoever, the plans and specifications relating to such construction or work required to be submitted under the SDBA shall be submitted to the local authority at the same time.</p> <p><b>Geological Survey</b> Under the Geological Survey Act 1974, the Director General of Geological Survey may authorize any Geological Survey Officer to undertake consultation, analysis or other service for any other person. The authorized person may however need to obtain the written approval of the proprietor or occupier of all land onto which he requires to enter, and to obtain such permits and authority as may be necessary under any law for the purpose of the consultation, analysis or other service.</p> <p>The area of land on which geological survey is required may be designated as the survey area. The Geological Survey Officer or an authorized person will then have power to enter any land within the designated area for the purpose of geological survey. The</p>	<p><b>Geological Survey</b> As the geological survey required for the CCS project may require more specific and technical expertise, an express authorisation to undertake consultation, analysis or other form of geological surveys can be given to any person intending to do so for the purpose of constructing CCS-enabled plant or exploring potential storage site.</p>



Issue	Area covered	Legal provisions	Competent authority	Permitting Timeline	Existing Regulatory Framework	Potential legislative amendment/Comment
				<p><b>Notification:</b> Generally 2 weeks for a permission to dig; 1 month for permission to dig a well. The timeline also depends on the yield</p>	<p>powers granted for this purpose include:</p> <ul style="list-style-type: none"> <li>(a) enter upon any land within the designated area;</li> <li>(b) cut, remove or otherwise clear such uncultivated vegetation as may be necessary for the proper conduct of such survey;</li> <li>(c) erect or emplace such pegs and marks as may be necessary for the proper conduct of such survey;</li> <li>(d) conduct a superficial geological survey;</li> <li>(e) conduct an artificial geophysical survey;</li> <li>(f) bore, drill, fracture, dig or pit over the land;</li> <li>(g) obtain and remove any specimen or sample from the land in furtherance of such survey and remove and dispose of as the Geological Survey Officer deems fit Superficial or cognate material as may be necessary to obtain the specimen or sample.</li> </ul> <p>Although this is set out in the legislation, in practice, a geological survey is made as part of the Permission to Build (or Development Order). The local authority issuing the Permission to Build, as part of the procedure, will request the Minerals and Geoscience Department to do the Geological Survey. The Minerals and Geoscience Department will then give the review of the geological survey to the local authority. So, there is usually no need for the applicant to apply for a geological survey.</p> <p>In any other case, any person who bores, drills, digs or otherwise develops a well for the purpose of searching for or extracting water therefrom shall notify the Director General of Geological Survey of such details. This does not include a well which is less than 30 feet in depth without reaching bedrock or yield less than 500 gallons of water per day.</p> <p>Further, any person who bores, drills, digs or otherwise develops a hole, pit, shaft, tunnel, cutting or other excavation exposing bedrock (as distinct from alluvium or detritus) shall also notify the Director General of Geological Survey of such details.</p>	

Issue	Area covered	Legal provisions	Competent authority	Permitting Timeline	Existing Regulatory Framework	Potential legislative amendment/Comment
		<p><b>Land Conservation Act 1960</b></p>	<p>Land Administrator</p>		<p><b>Land Conservation Act 1960</b></p> <p>The Land Conservation Act 1960 places emphasis on the conservation of hill land and the protection of soil from erosion and the inroad of silt. Activities of clearing and cultivation of hill land is restricted under Section 6. The Land Administrator may issue a notice to show cause against a prohibitory order if any earth, mud, silt, gravel or stone has interfered with any watercourse or cultivation of any other land or that by reason of the steepness of the slope of such land damage is likely to be caused or silt and erosion are going to take place.</p> <p>The Land Administrator can act under the power conferred by Section 14 which prohibits the removal of trees, plants, undergrowth, weeds or grass and/or making drains, watercourses, dams and retaining walls specific in strength to the issue or adopt any course of action to control the problem.</p>	
<p>1.1 C Threatened species impact approval</p>	<p>Design and construction - construction and planning</p>	<p>What are the key sections of the relevant act?</p> <p>Environmental Quality Act 1974 (Section 2 and 33)</p>	<p>Department of Environment</p>	<p>Not applicable</p>	<p><i>Are there any requirements to conduct a threatened species impact approval? How are these conducted?</i></p> <p>There is no legal requirement in Malaysia to conduct a separate threatened species impact approval. The impact assessment will be part of the EIA report.</p> <p>But note that a licence is required under the EQA for any activities causing pollution (discussed below) generally.</p> <p>"Pollution" under the EQA means any direct or indirect alteration of the physical, thermal, chemical, or biological properties of any part of the environment by discharging, emitting, or depositing environmentally hazardous substances, pollutants or wastes so as to affect adversely its use, to cause a condition which is hazardous or potentially hazardous to public health, safety, or welfare, or to animals, birds, wildlife, fish or aquatic life, or to plants or to cause a contravention of any condition, limitation or restriction to which a licence under this Act is subject</p> <p>Further, even with a licence, if it appears to the DOE that the collective effect of the aggregate of such wastes is likely to cause a worsening of conditions in that segment or element of the environment such as to affect the health, welfare or safety of human beings, or to threaten the existence of any animals, birds, wildlife, fish or other aquatic life, the DOE may, by notice, serve on each of the licensees, requiring each of them to abate such emission, discharge or deposit in the manner and within the period specified in the notice.</p>	<p>The environmental law regime in Malaysia (through EIA Approval or so called pollution licence) is currently broad enough to cover environmental impact on threatened species for construction of all new plants.</p>



Issue	Area covered	Legal provisions	Competent authority	Permitting Timeline	Existing Regulatory Framework	Potential legislative amendment/Comment
1.1 D Water management plan approval	Design and construction - construction and planning	<p>What are the key sections of the relevant act?</p> <p>Waters Act 1920 (Section 5 and 7)</p>	State Authority or District Officer	<p><b>Licence to extract water:</b> 2 weeks for on the surface water source; 1 month for underground water source</p>	<p><i>Is a water management plan required? Does it require approval by a regulatory body?</i></p> <p>Under the Constitution, matters pertaining to natural resources fall under the jurisdiction of the states. State Governments are responsible for the development, operation and maintenance of water supplies. The Federal Government however provides soft loans to State Governments for public water supply infrastructure and grant for rural water supply development. Water management thus falls within the responsibility of the State Authority rather than a private party.</p> <p>However, to the extent that the water management involves acts affecting rivers (e.g. felling any tree so that it falls into a river or in any manner obstruct or interfere with any river), a licence is required from the State Authority or the District Officer under the Waters Act 1920 (which only applies to the States of Negeri Sembilan, Pahang, Perak, Selangor, Malacca, Penang and Federal Territory). Further, no person can ditch, drain, channel, pipe or otherwise divert water of any river from its natural course without licence.</p> <p>A licence to divert water from a river may extend to authorizing the licensee to erect, cut, or construct and maintain upon or through any State lands or alienated lands specified in the licence, any pump, line of pipes, flume, race, drain, dam, or reservoir, to take and use the water from the river in such quantities and in such manner as in the opinion of the State Authority of such State may be necessary for carrying out the purpose of the license. The licensee may then enter the State lands or alienated lands to carry out all or any of the works sanctioned and exercise all or any of the rights granted, provided that compensation must be made to the owner or lawful occupier of the said alienated land.</p> <p>As such, a water management plan is only needed if water is extracted from a water source in the State and in such case, the water management plan must be submitted and approved by the State Government.</p>	

Issue	Area covered	Legal provisions	Competent authority	Permitting Timeline	Existing Regulatory Framework	Potential legislative amendment/Comment
1.1 E Environmental licences	Design and construction - construction and planning	<p>What are the key sections of the relevant act?</p> <p>Environmental Quality Act; Environmental Quality (Prescribed Premises) (Environmental Impact Assessment) Order 1987</p>	Department of Environment	<p><b>Preliminary EIA Approval:</b> 5 weeks (State DOE)</p> <p><b>Detailed EIA Approval:</b> 12 weeks (DOE HQ)</p>	<p><i>Is an environmental licence required? What conditions can be imposed? How long do they last for?</i></p> <p>Power Generation Licensees are generally subject to the following regulatory requirements imposed by the Department of Environment ("<b>DOE</b>") for construction of a power plant:</p> <ul style="list-style-type: none"> <li>(a) submission of the Detailed Environment Impact Assessment ("<b>EIA</b>") Report;</li> <li>(b) compliance with the Environmental Monitoring Programme;</li> <li>(c) submission of a written notification to construct a premises which generates industrial effluent, sewage and leachate;</li> <li>(d) grant of approval to construct fuel burning equipment; and</li> <li>(e) grant of permission to install an air pollution control and wastewater treatment system.</li> </ul> <p>The following authorities may make comments and recommendations on the imposition of conditions on the EIA approval:</p> <ul style="list-style-type: none"> <li>(a) The National Development Planning Committee for Federal Government sponsored projects;</li> <li>(b) The State Executive Council (EXCO) for State Government sponsored projects;</li> <li>(c) The various Local Authorities or Regional Development Authorities (RDA) with respect to planning approval within their respective area; and</li> <li>(d) The Ministry of Trade and Industry or MIDA for industrial projects.</li> </ul> <p>The Director General of Environmental Quality in DOE HQ is responsible for approving or rejecting the EIA and other grants of approval/permissions listed above.</p> <p>The Environmental Monitoring Programme (by the preparation and submission of Environmental Management Plan ("<b>EMP</b>") imposes a continuing obligation on the plant owner to ensure compliance with the EIA conditions. The EMP states in explicit terms what actions will be taken, what measures will be instituted,</p>	The environmental law regime in Malaysia is currently broad enough to cover construction of CCS-enabled plants. Conditions of EIA Approval as well as the EMP must however be specifically tailored for CCS projects.

Issue	Area covered	Legal provisions	Competent authority	Permitting Timeline	Existing Regulatory Framework	Potential legislative amendment/Comment
					<p>what structures will be built, what will be installed, when the actions will be executed and etc. in order for the project activities to be compliant with the EIA approval conditions. EMP is subject to review and update when circumstances require so. For as long as the plant is in place, there is a requirement to comply with the continuing obligations in the EMP. The DOE may require the owner or occupier of any premise to carry out environmental audits and to submit the audit report to the DOE for review. One of the objectives of the environmental audit is to ensure compliance with the EMP.</p>	
Existing power plant - retrofitting approval		What are the key sections of the relevant act?	Who makes decision		<p><i>Are there any approvals required to retrofit an existing power plant? What are the conditions that can be placed on approval? How is the approval gained?</i></p> <p>There is currently no system of approvals relating specifically to the retrofitting of an existing power plant with CCS capabilities.</p> <p>However, section 22(1) of the Electricity Supply Act 1990 ("ESA") provides that subject to any exemption granted under the ESA, any person who intends to construct, extend or alter any installation shall give notice of the proposed construction, extension or alteration to the Energy Commission. Such person or a person authorized by him has to submit plans and obtain prior approval from the Energy Commission who may periodically inspect the installation thereof.</p> <p>Under the ESA, "Installation" is defined to mean any plant or equipment designed for the supply or use of electricity, including all, buildings and land in connection therewith, all under one ownership or management.</p> <p>The definition appears to be broad enough to capture retrofitting the plant for CCS capabilities.</p> <p>However, based on oral enquiries with the Energy Commission, the retrofitting an existing power plant does not require approval from the Energy Commission unless it involves any modification to an existing power plant which results in electricity outage of the power plant. We understand that in this case, prior written approval from TNB is generally required under the contractual terms between the independent power producer and TNB. However, this is a matter of policy adopted by the Energy Commission. Technically speaking prior approval from the Energy</p>	We understand that retrofitting for CCS purposes does not generally involve an increase in the capacity or electricity output. As such, there is currently no prior approval required. This position should be maintained so that the power plant which is interested in retrofitting the plant for CCS capabilities will not be subject to undue regulatory costs.

Issue	Area covered	Legal provisions	Competent authority	Permitting Timeline	Existing Regulatory Framework	Potential legislative amendment/Comment
		Town and Country Planning Act 1976 ("TCPA") (Sections 19, 21, 21A)	Local Council	<b>Planning Approval:</b> Approximately 100 - 125 days (varies according to the local councils)	<p>Commission should be obtained under the ESA.</p> <p><b>Department of Environment</b></p> <p>The Environmental Quality Act 1974 and the Environmental Quality (Scheduled Wastes) Regulations 2005 impose notification requirements on waste generators.</p> <p>The First Schedule to the 2005 Regulations list out the Scheduled Wastes. If any of the chemicals used as capture agents are classified as scheduled wastes, the waste generator is required to notify the MNRE within 30 days from the date of generation of the waste, of the categories and quantities of scheduled wastes generated.</p> <p>Similarly, any increase in the capacity of the power plant, construction of fuel burning equipment and installation of an air pollution control and wastewater treatment system needs to get prior written approval from the DOE.</p> <p><b>Planning Approvals</b></p> <p>Under the Federal Constitution, the State Authority is responsible for the general policy in respect of the planning and development and use of all lands and buildings within the area of every local authority in the state.</p> <p>The TCPA, which is only applicable in Peninsula Malaysia, defines "development" as the carrying out of any building, engineering, mining, industrial or other similar operations in, on, over or under land, or the making of any material change in the use of any buildings or other land, or the subdivision or amalgamation of lands. To the extent that the retrofitting of the power plant constitutes "development" under the TCPA, planning permission of the relevant local authority must be obtained.</p> <p>Under the TCPA, no person shall commence, undertake or carry out any development unless planning permission in respect of the development has been granted. An application for planning permission must be made to the relevant local authority using the prescribed form and shall be accompanied by such documents, plans and fees as may be prescribed. In the event that the applicant is not the owner of the land on which the development is to be carried out, the written consent of the owner must be obtained and endorsed on the application.</p> <p>Note that a planning permission granted will lapse 12 months after</p>	

Issue	Area covered	Legal provisions	Competent authority	Permitting Timeline	Existing Regulatory Framework	Potential legislative amendment/Comment
					the date of in which it was granted unless extended.	
1.1 G Pollution licences	Design and construction - construction and planning	<p>What are the key sections of the relevant act?</p> <p>Environmental Quality Act 1974 (Section 21, 24 and 25)</p>	Department of Environment (State)	<b>Pollution Licence:</b> around 1 month	<p><i>Is a pollution licence required? What are the conditions applied? Does there need to be a variation to existing licences</i></p> <p>Yes. The DOE has broad authority under the Environmental Quality Act 1974 ("<b>EQA</b>") to develop regulations and standards for activities that falls within the scope of EQA. The DOE can specify the acceptable conditions for the emission, discharge or deposit of environmentally hazardous substances, pollutants or wastes or emission of noise into any area, segment or element of the environment and may set aside any area, segment or element of the environment within which the emission, discharge or deposit is prohibited or restricted (Section 21). No person is allowed to pollute or cause or permit to be polluted:</p> <p>(a) any soil or surface of any land;</p> <p>(b) inland waters (including groundwater),</p> <p>in contravention of such acceptable conditions, unless they hold a licence.</p> <p>This "pollution licence" is granted only for short period of time because the ultimate objective is for the licensee to eventually comply with the acceptable conditions. As such, no change to the conditions in the EIA Approval is required.</p>	<p>The acceptable conditions of CO<sub>2</sub> and the limit of emission of CO<sub>2</sub> may be prescribed in regulations in order to incentivise CO<sub>2</sub> capture and storage.</p> <p>Once acceptable conditions for CO<sub>2</sub> has been prescribed, in the event of leakages of CO<sub>2</sub> (or other prescribed incidental gaseous materials) in the capturing process, the pollution licence may be granted but it must identify the remediation plan and reasonable period for compliance with the acceptable conditions.</p>
1.1 H Occupational Health and Safety - obligations	Design and construction - construction and planning	<p>What are the key sections of the relevant act?</p> <p>Occupational Safety and Health Act 1994 (Sections 15 and 16)</p>	Department of Occupational Safety and Health (" <b>DOSH</b> "); Ministry of Human Resources	Not applicable	<p><i>Are there any occupational health and safety obligations associated with the construction of a CO<sub>2</sub> capture facility?</i></p> <p>There is no specific occupational health and safety obligations associated with the construction of CO<sub>2</sub> capture facility.</p> <p>Generally, occupational safety and health is governed by the Occupational Safety and Health Act 1994 ("<b>OSHA</b>"). In brief, all employers have a general duty ensure the safety, health and welfare at work of all his employees. This includes the provision of training and supervision, and the provision of a safe working environment. There is a duty on the employer to prepare and revise a written statement of his general policy with respect to safety and health at work (s 16). Employers also have a duty to ensure the safety and health of persons other than his employees, as far as is practicable.</p> <p>Employers must notify the nearest occupational safety and health office of any accident, dangerous occurrence etc. that has</p>	

Issue	Area covered	Legal provisions	Competent authority	Permitting Timeline	Existing Regulatory Framework	Potential legislative amendment/Comment
					<p>occurred or is likely to occur at his place of work (s 32).</p> <p>Employees have also have duties, amongst others, to take reasonable care for the safety and health of himself and other persons who may be affected by his acts or omissions at work and to comply with any instructions on occupational safety and health instituted by his employer (s 24).</p> <p>There are industry codes of practice that may be approved by the Minister (s 37) and published by DOSH. e.g. Code of Practice for Road Transport Activities, Code of Practice for Safe Working in a Confined Space and Code of Practice on Indoor Air Quality. In addition, the Department of Occupational Safety and Health also publishes non-binding guidelines.</p> <p>Note that there is a general power granted to the Minister to prescribe by Regulations the requirements with respect to the design, construction, guarding, siting, installation, commissioning, examination, repair, maintenance, alteration, adjustment, dismantling, testing, marking or inspection of any plant.</p>	



TABLE 1.2: CAPTURE - OPERATION

Issue	Area covered	Legal provisions	Competent authority	Timeline	Work needed to resolve issue	Potential legislative amendment/Comment
1.2 A Classification of CO <sub>2</sub> - licencing requirements	Operation	<p>What are the key sections of the relevant act?</p> <p>Environmental Quality Act 1974 (Section 2, 21, 24 and 25); Environmental Quality (Clean Air) Regulations 1978 ) (Regulation 3, 7, 8 and 20)</p>	<p>Ministry of Energy, Green Technology and Water ; Department of Environment (HQ Air Division)</p>	<p>Not applicable</p>	<p><i>How is CO<sub>2</sub> classified under Malaysian Law? Is it a pollutant etc? Are there any licencing requirements?</i></p> <p>No, CO<sub>2</sub> is currently not classified in Malaysia. The definition of "pollutant" is however very broad under the EQA and may encompass CO<sub>2</sub> in certain forms. Alternatively, CO<sub>2</sub> in certain forms will also fall within the definition of "wastes".</p> <p>"Pollutant" means any natural or artificial substances, whether in a solid, semi-solid or liquid form, or in the form of gas or vapour, or in a mixture of at least two of these substances, or any objectionable odour or noise or heat emitted, discharged or deposited or is likely to be emitted, discharged or deposited from any source which can directly or indirectly cause pollution and includes any environmentally hazardous substances. Please refer to table 1.1 for definition of "pollution" under the EQA.</p> <p>"Waste" includes any matter prescribed to be scheduled waste, or any matter whether in a solid, semi-solid or liquid form, or in the form of gas or vapour which is emitted, discharged or deposited in the environment in such volume, composition or manner as to cause pollution.</p> <p>In such case, the Minister of Energy, Green Technology and Water may specify in the regulations the acceptable conditions for the emission, discharge or deposit of pollutants, wastes or environmentally hazardous substances or emission of noise into any area, segment or element of the environment and may set aside any area, segment or element of the environment within which the emission, discharge or deposit is prohibited or restricted. Any person who contravenes the acceptable conditions will commit an offence unless a licence has been obtained.</p> <p>The Environmental Quality (Clean Air) Regulations 1978 )("Clean Air Regulations") applies to facilities or processes that discharges or is capable of discharging air impurities into open air, including every chimney, industrial plant and fuel burning equipment. The burning of combustible materials, produce or waste must be done in an incinerator of such type and design approved by the DOE. The erection, installation, alteration and construction of incinerators is subject to prior written approval from the DOE.</p> <p>"Air impurities" includes smoke, soot, dust, ash (including flyash), cinders, grit, solid particles of any kind inclusive of particulates, gases, fumes, mist, odours and radioactive substance which are generated as a result of combustion of fuel</p>	<p>Although the definition of "pollutant" and "wastes" in the current environmental law regime of Malaysia can potentially cover CO<sub>2</sub>, no actual legal obligation exists unless and until acceptable conditions for CO<sub>2</sub> has been prescribed and regulated. As above, we are of the view that the acceptable conditions of CO<sub>2</sub> and the limit of emission of CO<sub>2</sub> may be prescribed in regulations in order to incentivise CO<sub>2</sub> capture and storage.</p> <p>As the Ministry has wide discretion in specifying acceptable conditions, this can be tailored to suit each CCS project as well.</p>

Issue	Area covered	Legal provisions	Competent authority	Timeline	Work needed to resolve issue	Potential legislative amendment/Comment
					<p>and the like, or a result of the use of electricity as a heat source, or a result of synthesis, resolution or any other treatment and any other substance which may be designated by the Minister as those which are liable to affect adversely the human health or the living environment.</p> <p>The standards of compliance under the Clean Air Regulations vary depending on whether it is a new facility or existing facility. No standard or acceptable limit has been prescribed for CO<sub>2</sub> or the potential associated/incidental gas resulting from the combustion process.</p>	
1.2 B Liability - failure to capture	Operation	<p>What are the key sections of the relevant act?</p> <p>Environmental Quality Act 1974 (Section 22 and 31)</p>	Department of Environment	Not applicable	<p><i>Is there any liability associated with failing to capture CO<sub>2</sub>? Is there a certain amount of CO<sub>2</sub> that must be captured?</i></p> <p>There is no such liability currently being imposed. Also, no acceptable limit of CO<sub>2</sub> has been prescribed under any of the environmental legislation in Malaysia.</p> <p>However, there is currently a restriction against emission or discharge of any environmentally hazardous substances, pollutants or wastes into the atmosphere in contravention of prescribed acceptable conditions. Where any environmentally hazardous substances, pollutants or wastes are being or are likely to be emitted, discharged or deposited from any vehicle, ship or premises or from any aircraft, the DOE may also by notice in writing require the owner or occupier of the vehicle, ship or premises, or aircraft, to:</p> <p>(a) install and operate any control equipment or additional control equipment;</p> <p>(b) repair, alter or replace any equipment or control equipment;</p> <p>(c) erect or increase the height of any chimney;</p> <p>(d) measure, take a sample of, analyse, record and report any environmentally hazardous substances, pollutants, wastes, effluents or emissions containing pollutants;</p> <p>(e) conduct a study on any environmental risk;</p> <p>(f) install, maintain and operate a monitoring programme at the expense of the owner or occupier; or</p> <p>(g) adopt any measure to reduce, mitigate, disperse, remove, eliminate, destroy or dispose of pollution;</p> <p>within such time and in such manner as may be specified in the notice. Any person who contravenes the notice issued by the DOE in this respect will be guilty of an offence and shall be liable to a fine not exceeding RM25,000 or imprisonment for a period</p>	As above. If the acceptable conditions for CO <sub>2</sub> has been prescribed, and the emission of CO <sub>2</sub> exceeds the prescribed acceptable conditions, the DOE may order the plant owner to remedy the situation including to capture specified amount of CO <sub>2</sub> .



Issue	Area covered	Legal provisions	Competent authority	Timeline	Work needed to resolve issue	Potential legislative amendment/Comment
					not exceeding 2 years or both. A further fine not exceeding RM1,000 a day for every day that the offence continues after the service of notice shall also be imposed.	
1.2 C Management approvals/qualifications	Operation	What are the key sections of the relevant act?	Not applicable	Not applicable	<p>Does the management team require specific qualifications or approvals to operate a carbon capture facility?</p> <p>No specific stipulation for carbon capture facility yet.</p> <p>There is no specific qualification or approval required to operate a power plant facility. However, operation of a power plant is usually carried out by third party Operating &amp; Maintenance company ("<b>O&amp;M Company</b>"). There is uncertainty at law as to whether the O&amp;M Company is required to be licensed and registered under the Registration of Engineers Act 1967 ("<b>REA</b>"). The scope of work of O&amp;M Company could potentially fall within the regulatory regime of REA but we understand that in practice, that only one of the O&amp;M Companies in Malaysia has registered with the Board of Engineers under the REA. If such registration is required, all shareholders of the registered engineering firm must be registered qualified engineers in Malaysia.</p>	
1.2 D Taxation of CO <sub>2</sub>	Operation	What are the key sections of the relevant act?	Not applicable	Not applicable	<p>Is there taxation of captured CO<sub>2</sub>?</p> <p>No specific tax imposed for captured CO<sub>2</sub> yet.</p>	
1.2 E Noise approval	Operation	<p>What are the key sections of the relevant act?</p> <p>Environmental Quality Act 1974 (Section 23 and 51)</p>	Department of Environment	Not applicable	<p>Is a noise pollution permit required? What are limitations on noise levels originating from site?</p> <p>Yes. Under the EQA, no person shall, unless licensed, emit or cause or permit to be emitted any noise greater in volume, intensity or quality in contravention of the conditions specified under Section 21 of the EQA.</p> <p>The Minister may also make regulations for defining objectionable noise and prescribing standards for tolerable noise.</p> <p>There are currently no acceptable conditions and parameter standards that are imposed by the Director General in respect of the permissible noise limit. However, the noise limit (which will vary on case by case basis) will usually be stipulated in the EIA approval and must be complied with on an on-going basis.</p>	

Issue	Area covered	Legal provisions	Competent authority	Timeline	Work needed to resolve issue	Potential legislative amendment/Comment
Occupational Health and Safety - obligations	Operation	<p>What are the key sections of the relevant act?</p> <p>Occupational Safety and Health Act 1994 (Sections 15 and 16)</p>	<p>Department of Occupational Safety and Health ("DOSH"); Ministry of Human Resources</p>	Not applicable	<p><i>Are there any occupational health and safety obligations associated with the operation of a CO<sub>2</sub> capture facility?</i></p> <p>Please refer to the above response.</p>	

TABLE 1.3: CAPTURE - DECOMMISSIONING

Issue	Area covered	Legal provisions	Competent authority	Timeline	Work needed to resolve issue	Potential legislative amendment/ Comment
1.3 A Decommissioning requirement	Decommissioning	<p>What are the key sections of the relevant act?</p> <p>Street, Drainage and Building Act 1971 ("SDBA")(Section 83 and 85A)</p>	Local Authority	Not applicable	<p><i>Are there any legal requirements to decommission a plant? When does this arise?</i></p> <p>No legal obligation to decommission a power plant or other manufacturing plant in Malaysia. But the Tenaga Nasional Berhad ("TNB") may be given an option to purchase the plant in the Power Purchase Agreement if it wishes and the plant owner must sell to the TNB upon the expiry of the Power Purchase Agreement.</p> <p>That said, under the SDBA, the local authority may, by a notice in writing served on the owner of a building, require the building to be inspected:</p> <p>(a) after the tenth year commencing from the date the certificate of completion and compliance in respect of the building was issued; and</p> <p>(b) thereafter at intervals of not more than ten years from the date of the completion of the last inspection of the building.</p> <p>The local authority may thereafter:</p> <p>(a) issue an order to the owner of the building to take the necessary measures to rectify or remedy any defect, deformation or deterioration as recommended by the engineer within such period as the local authority may specify; or</p> <p>(b) in place of an inquiry under section 83 of the SDBA, issue an order to the owner of the building for closure and demolition of the building.</p> <p>Section 83 of the SDBA gives power to the local authority to require the owner of any building to either repair the defects or demolish the building within such period of time as the local authority may specify if it is satisfied that any building or anything affixed thereon is in a ruinous state, likely to fall or is in any way dangerous to any person therein or foot passengers on the streets adjoining such building.</p>	

Issue	Area covered	Legal provisions	Competent authority	Timeline	Work needed to resolve issue	Potential legislative amendment/ Comment
1.3 B Contaminated Land	Decommissioning	<p>What are the key sections of the relevant act?</p> <p>Environmental Quality Act (Section 31; Section 31A)</p>	Department of Environment	Not applicable	<p><i>Are there any contaminated land associated obligations? Is rehabilitation required? Are there on going monitoring obligations?</i></p> <p>Section 31(1) of the EQA empowers the Director General to issue a notice to the owner/occupier of land ("<b>Notice</b>") requiring the owner/occupier of the land to take steps to reduce, mitigate, disperse, remove, eliminate, destroy or dispose of pollution within a time specified under the Notice.</p> <p>The Notice (to clean-up) is issued to the owner/occupier of the contaminated land. The Notice can still be issued to the owner or occupier even if it was not the owner/occupier who polluted the premises. In practice, the DOE will not undertake additional work and effort to identify the previous owner/occupier who caused the contamination. The current owner/occupier is ultimately liable for the clean-up under the EQA once the Notice is issued.</p> <p>Under Section 31A (2) of the EQA, the Minister of Natural Resources and Environment ("<b>Minister</b>") may also in his discretion direct the Director General to issue an order to require a person to cease all acts that have resulted in the release of environmentally hazardous substances, pollutants or wastes. The Minister may also direct the Director General to effect and render any machinery, equipment, plant or process to be inoperable if he considers that the operations of such machinery, equipment or plant is a threat to the environment, public health or safety.</p> <p>There are currently no acceptable conditions and parameter standards that are imposed by the Director General in respect of the discharge of waste onto land or the standard of clean-up required. Pending the issuance of such conditions and standards, the circumstances in which a clean up is required is decided on a case by case basis at the discretion of the Director General. The owner/occupier who received the Notice must ensure that all requirements specified in the Notice are complied with within the timeframe specified.</p> <p>Third parties may seek to claim damages through common law claims of negligence, nuisance or trespass. In bringing a claim, the third party must show that the contamination is an unlawful interference with his use, comfort, enjoyment or interest over his land.</p>	

**TABLE 2.1: TRANSPORT - DESIGN AND CONSTRUCTION**

Issue	Area covered	Legal provisions	Competent authority	Timeline	Work needed to resolve issue	Potential legislative amendment/ Comment
2.1 A Transport licence	Transport - Design and Construction	<p>What are the key sections of the relevant act?</p> <p>Land Public Transport Act ("LPTA"); Petroleum Development Act 1974 ("PDA") (Section 6); Petroleum Regulations 1974 ("PR") (Regulation 3A); Railways Act 1991 ("RA") (Section 23); Merchant Shipping Ordinance ("MSO")</p>	<p>Land Public Transport Commission ("LPTC"); Ministry of Domestic Trade, Co-Operatives and Consumerism ("MDTCC"); Domestic Shipping Licensing Board ("DSL B"); Malaysian Marine Department ("MMD") and Domestic Shipping Licensing Board ("DSL B")</p>	<p><b>Operator's Licence:</b> 1 -2 months</p> <p><b>Carriers' Licence under PDA and PR:</b> 1 - 5 days</p>	<p><i>Is a transport licence required to transport captured CO<sub>2</sub>? What are the different licencing requirements for different transport modes (road, rail, etc)?</i></p> <p><b>Transportation of CO<sub>2</sub> by Road</b></p> <p>The LPTA, which regulates all matters relating to land public transport, provides that any person operating or providing a goods vehicle service using a class of goods vehicles for the carriage of goods for hire or reward or for or in connection with any trade or business requires an operator's licence.</p> <p>"Goods vehicle" is defined under the LPTA to mean:</p> <ul style="list-style-type: none"> <li>(a) any motor vehicle constructed or adapted for use for the carriage of goods or a trailer so constructed or adapted; or</li> <li>(b) any motor vehicle or a trailer not so constructed or adapted when used for the carriage of goods solely, or in addition to passengers.</li> </ul>	<p>Transport licence for the transportation of captured CO<sub>2</sub> is currently not regulated in Malaysia.</p> <p>The PDA and PR can be amended to require the permission of the MDTCC be obtained for the transportation of captured CO<sub>2</sub> by road, rail and sea.</p>

Issue	Area covered	Legal provisions	Competent authority	Timeline	Work needed to resolve issue	Potential legislative amendment/ Comment
				<b>Railway Operator's Licence:</b> 1 -2 months	<p>"Goods vehicle service" means the carriage of goods for any third party by means of a goods vehicle for hire or reward or in connection with a trade or business.</p> <p>A person is deemed under the LPTA to be operating or providing a goods vehicle service if he:</p> <ul style="list-style-type: none"> <li>(a) uses or drives a goods vehicle or a class of goods vehicles himself; or</li> <li>(b) employs one or more persons to use or drive a class of goods vehicle,</li> </ul> <p>to operate or provide a goods vehicle service, and</p> <ul style="list-style-type: none"> <li>(i) he owns the said goods vehicle; or</li> <li>(ii) he is responsible, under any form of arrangement with the owner or lessor of the said goods vehicle to manage, maintain or operate such goods vehicle.</li> </ul> <p>Failure to comply with the licensing requirements is an offence and a company on conviction may be liable to a fine not exceeding RM200,000.</p> <p><u>Licensing of operators of goods vehicle</u></p> <p>There are 2 classes of goods vehicle under the LPTA:</p> <ul style="list-style-type: none"> <li>(a) Licence A carriers - issued to operators of vehicles carrying items for rent and hire (i.e. in relation to the provision of a service / logistics); and</li> <li>(b) Licence C carriers - issued to operators of vehicles carrying privately owned goods.</li> </ul> <p>Licence A carriers are entitled to operate in the whole of Peninsular Malaysia whereas Licence C carriers are only allowed to operate within the nearest 7 states within Peninsular Malaysia, save for the freight of certain goods such as cars, chemicals, highly flammable goods, petroleum gas and oxygen. However, based on no-names enquiries made with the LPTC, we understand that there has been a recent policy decision that removed the restrictions imposed on Licence C carriers. This however has not been made publicly available.</p> <p><b>PDA and PR</b></p> <p>Note that in addition to a carriers licence, there is also a requirement under the PDA and PR for the permission of the MDTCC to be obtained to commence or continue any business of marketing or distributing (including transportation) of petroleum or petrochemical products.</p>	

Issue	Area covered	Legal provisions	Competent authority	Timeline	Work needed to resolve issue	Potential legislative amendment/ Comment
				<p><b>Domestic Shipping Licence: 2 - 5 days</b></p>	<p><b>Transportation of CO<sub>2</sub> by Rail</b></p> <p>Under the RA, no person shall operate any railway except under a licence issued by the LPTC.</p> <p>The licence issued will set out the duration of the licence and further prescribe:</p> <ul style="list-style-type: none"> <li>(a) the type of railway system and services to be operated by a railway company;</li> <li>(b) the annual licence fee payable by the railway company;</li> <li>(c) the particular duties of a railway company in respect of the railway services operated or facilities provided by it; and</li> <li>(d) any such other matter or conditions as the minister thinks fit.</li> </ul> <p>Accordingly, railway operators are required to be licensed by the LPTC.</p> <p>Based on no names enquiries with officers at LPTC, we understand that by drawing an analogy with the transportation of petroleum by rail in Malaysia (given that the transportation of CO<sub>2</sub> is not regulated in Malaysia), the owner of the petroleum is not required under law to obtain any transportation licence or permit. We understand that the owner of the petroleum would merely enter into an agreement with the licensed railway operator. It is up to the railway operator to assess the risk involved in the carriage of petroleum. In the event the railway operator agrees to transport the petroleum, the petroleum owner will have to abide by the terms of carriage of the railway operator.</p> <p><b>Transportation of CO<sub>2</sub> by Sea</b></p> <p>MSO provides that no ship other than a Malaysian ship (i.e. ships registered under the Malaysian Ship Registry or Malaysian International Ship Registry) may engage in domestic shipping. Domestic shipping means the use of a ship for the provision of services, the shipment of goods or the carriage of passengers within Malaysian territorial waters or the Malaysian exclusive economic zone ("<b>Domestic Shipping Activities</b>"). Any ships engaged in Domestic Shipping Activities must hold a valid Domestic Shipping Licence issued by the DSLB.</p> <p>Notwithstanding the requirement for a ship to be a Malaysian ship, foreign-owned vessels are also able to carry out Domestic Shipping Activities provided that the operator of the foreign-owned vessel is able to demonstrate to the MMD that there are no available Malaysian ships to meet specific trade needs. We understand in order for a foreign-owned vessel to be able to carry out Domestic Shipping Activities, the operators</p>	

Issue	Area covered	Legal provisions	Competent authority	Timeline	Work needed to resolve issue	Potential legislative amendment/ Comment
					<p>of the foreign owned vessel must obtain a confirmation from the Malaysian Shipping Association confirming that there are no available Malaysian ships to meet the specific trade needs.</p> <p><b>PDA and PR</b> Note that there is also a requirement under the PDA and PR for the permission of the MDTCC to be obtained to commence or continue any business of marketing or distributing (including transportation and the shipping) of petroleum or petrochemical products.</p> <p><b>PSMA</b> The PSMA governs the permitted loading, unloading and discharging of petroleum, No petroleum may be loaded or unloaded or discharged except at a port which has been appointed for that purpose. by notification in the Gazette (i.e. dangerous petroleum anchorages, prohibited areas, dangerous areas and non-dangerous areas of ports).</p> <p>The PSMA provides that no vessel having petroleum on board as cargo shall enter the limits of any port except for the purpose of proceeding directly to the petroleum anchorage without the permission of the port officer previously obtained in writing.</p> <p>Upon arrival into port, the master of any vessel carrying petroleum or the importer, consignee or owner of any petroleum carried in any vessel as cargo is required to, except when the owner or agent of the vessel has previously so done, notify the inspector of the arrival into port and include in the notification such particulars necessary to enable the petroleum to be properly inspected. Upon the receipt of notice, the inspector may board the vessel and take samples to be tested, Immediately upon the completion of such testing, the inspector will issue a certificate to the port officer.</p> <p>After inspection by the inspector, the permission of the port officer is required for the unloading or discharging of petroleum, Note also that no petroleum is permitted to be unloaded or discharged between the hours of sunset and sunrise except with the permission of the port officer.</p>	
2.1 B Pipelines - licence	Transport - Design and Construction	What are the key sections of the relevant act?			<p><i>Is a pipeline licence required to construct or operate a pipeline to transfer CO<sub>2</sub>?</i></p> <p>No. We are not aware of any legislation / regulation in Malaysia which regulates the construction or operation of a pipeline to transfer CO<sub>2</sub>.</p>	See potential legislative amendment for using existing oil & gas pipelines to transport CO <sub>2</sub> .



Issue	Area covered	Legal provisions	Competent authority	Timeline	Work needed to resolve issue	Potential legislative amendment/ Comment
2.1 C Pipelines - operating existing infrastructure	Transport - Design and Construction	<p>What are the key sections of the relevant act?</p> <p>Petroleum Development Act 1974 ("<b>PDA</b>"); Petroleum Regulations 1974 ("<b>PR</b>")</p>	<p>Petroleum Nasional Berhad ("<b>Petronas</b>") and Ministry of Domestic Trade, Co-Operatives and Consumerism ("<b>MDTCC</b>")</p>	<p><b>Petronas Licence:</b> 1 - 3 months</p>	<p><i>Are there any requirements for using existing oil &amp; gas pipelines to transport CO<sub>2</sub>?</i></p> <p><b>Petronas Licence for Piping Services</b></p> <p>By way of background information, under the PDA, Petronas, Malaysia' national oil corporation, is vested with the entire ownership and exclusive rights of exploring and exploiting petroleum resources onshore and offshore in Malaysia.</p> <p>Under the PR, a company carrying on the following upstream oil activities must obtain a valid licence from Petronas ("<b>Petronas Licence</b>"):</p> <p>(a) commencing or continuing any business or service, onshore or offshore relating to the exploration and exploiting of petroleum, and in particular involving the supply or use of rigs, derricks, ocean tankers and barges;</p> <p>(b) commencing or continuing business or service involving the supply of equipment, facilities and services required in connection with the exploration of petroleum, including, among others, the supply of all exploration, drilling and production materials, equipment, platforms, derricks, tools and installations, <u>pipe and pipe-laying services</u>, barges and tankers.</p> <p>Note that applicants seeking to apply for a Petronas licence are required to satisfy the requirements imposed by Petronas, such as, to be a locally incorporated private or public limited company, meet the Bumiputera (local indigenous people) participation requirement in accordance with the relevant Standard Work and Equipment Code ("<b>SWEC</b>"), to be registered with the statutory, professional or governmental bodies as required by the relevant SWEC, etc.</p>	<p>The construction of oil and gas pipelines is regulated in Malaysia. It is possible that the regulatory regime for the construction of oil and gas pipelines be amended to include the transportation of CO<sub>2</sub>.</p>
		<p>Petroleum (Safety Measures) Act 1984 ("<b>PSMA</b>") (Section 16); Petroleum (Safety Measures) (Transportation of Petroleum by Pipelines) Regulations 1985 ("<b>PSM Regulations</b>") (Regulation 5, 14)</p>	<p>Department of Occupational Safety and Health ("<b>DOSH</b>")</p>	<p><b>Permission for Pipeline Installation:</b> 15 working days</p>	<p><b>Installation of Pipeline</b></p> <p>The PSMA provides that the permission of the DOSH is required to undertake any pipeline works and installation in or on land, on the surface of or underwater, onshore or offshore for the transportation of petroleum by pipelines.</p> <p>Generally, an application for permission to install should be submitted for:</p> <p>(a) pipelines transporting liquefied petroleum between production facilities, tank farms, natural gas processing plants, refineries, service stations, terminals (marine, rail</p>	

Issue	Area covered	Legal provisions	Competent authority	Timeline	Work needed to resolve issue	Potential legislative amendment/ Comment
		<p>Gas Supply Act 1993 ("<b>GSA</b>") (Section 11, 35); Gas Supply Regulations 1997 ("<b>GSR</b>") (Regulation 81, 103, 15(1))</p>	<p>Energy Commission</p>	<p><b>Gas utility licence:</b> 60 days</p> <p><b>Private gas licence:</b> 1 day</p> <p><b>Certificate of competency:</b> 70-80 days</p> <p><b>Registration as a gas competent person:</b> 1 day</p>	<p>and truck) and other delivery and receiving points; and/or</p> <p>(b) pipelines transporting natural gas from the outlet of separators or traps at oil wells, up until the outlet of the customer's meter set assembly, including gas processing plants, and metering and regulating stations.</p> <p>In the event that the existing pipelines is required to be modified for the transportation of CO<sub>2</sub>, the permission of the DOSH is required. Such permission is required where the modification affects the basic design and specification, such as the maximum design operating pressure, maximum design operating temperature, type of fluid to be carried and change of route.</p> <p><b>Supply of Gas</b></p> <p><u><i>Licence to Supply Gas Through Pipelines</i></u></p> <p>A licence issued by the Energy Commission is required for any person intending to supply gas through any pipelines. There are 2 types of licences issued by the Energy Commission, a gas utility licence or a private gas licence.</p> <p>A private gas licensee is a person who supplies and uses gas through a gas pipeline on his own property or the property of the owner or occupier but does not include a person obtaining the supply of gas from a gas utility licensee. A gas utility licensee means a person supplying gas through a gas pipeline to a person other than the private gas licensee.</p> <p><u><i>Certificate of Competency and Registration As a Gas Competent Person</i></u></p> <p>The GSA and GSR provides that no work in respect of installing, constructing, maintaining, repairing or operating any gas pipelines or installation shall be carried out except by or under the supervision of and certified by a person holding a Certificate of Competency issued under the GSR. There are 5 competency classes of competent person as follows:</p> <p>(a) Gas Engineer;  (b) Gas Engineer Supervisor;  (c) Gas Fitter Class I;  (d) Gas Fitter Class II; and  (e) Gas Fitter Class III</p> <p>In general, the scope of work for competent persons is divided into 5 types as follows:</p>	

Issue	Area covered	Legal provisions	Competent authority	Timeline	Work needed to resolve issue	Potential legislative amendment/ Comment
				<p><b>Registration as a gas contractor:</b> 2 days</p> <p><b>Approval to install gas installations:</b> 15 days</p>	<p>(a) endorsement of gas installation plans;            (b) endorsement of certificates of completion of gas installations;            (c) endorsement of test certificates of gas installations;            (d) repair of gas installation; and            (e) maintenance of gas installations.</p> <p><u>Registration as a Gas Contractor</u></p> <p>Regulation 103 of the GSR stipulates that no person shall perform or carry out installing, constructing, testing, commissioning, calibrating, maintaining, repairing or operating a gas pipeline or gas installation unless he holds a valid Certificate of Registration as a Gas Contractor issued under the GSR.</p> <p>For registration purposes, gas contractors are classified into 4 classes; Class A, B, C and D. The competency of contractors is controlled by the provision which requires that competent persons of the relevant class of competency have to be employed by the contractor.</p> <p><u>Approval to Install Gas Installations</u></p> <p>Under Regulation 15(1) of the GSR, an Approval to Install has to be obtained from the Energy Commission before commencing work on an installation which is new, being extended or being modified. To obtain the approval, the design plan, engineering calculations and the specifications of the gas equipment which have been endorsed by competent persons qualified for the class of the installation concerned, have to be submitted to the Energy Commission.</p> <p>Note that the Energy Commission has also specified the design codes which have to be used as the basis for designing gas pipeline systems and installations. The design codes are:</p> <p>(a) MS 830 - Malaysian Code of Practice for Storage, Handling and Transportation of Liquefied Petroleum Gas;            (b) MS 930 - Malaysian Code of Practice for the Installation of Fuel Gas Piping Systems and Appliances; and            (c) ANSI/ASME B 31.8 - American National Standard for Gas Transmission and Distribution Piping System.</p>	<p>The EQA is currently broad enough to cover the construction of pipelines.</p> <p>Similar to the design codes specified by the Energy Commission for gas pipeline systems and installations, design codes for CO<sub>2</sub> pipeline specifications may also be developed by the relevant authority.</p>

Issue	Area covered	Legal provisions	Competent authority	Timeline	Work needed to resolve issue	Potential legislative amendment/ Comment
		Environmental Quality Act 1974 (" <b>EQA</b> ") (Section 34A, 34AA); Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 1987	Department of Environment; Ministry of Natural Resources and Environment (" <b>MNRE</b> ")	<b>Preliminary EIA Approval:</b> 5 weeks (State DOE)  <b>Detailed EIA Approval:</b> 12 weeks (DOE HQ)	<b>Environmental Impact Assessment</b>  The construction of off-shore and on-shore pipelines in excess of 50km in length is a prescribed activity under the Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 1987.  Note that under the EQA, the Director General may issue a prohibition order or stop work order to the person carrying the prescribed activities:  (a) without the approval of the Director General; (b) who violates any conditions attached to the approval of the EIA Report; or which in the opinion of the Director General are being carried out in a manner that is likely to cause environmental damage.	
2.1 D Pipelines - new pipeline approval	Transport - Design and Construction	What are the key sections of the relevant act?  Environmental Quality Act 1974 (" <b>EQA</b> ") (Sections 18, 19, 33A, 34A, 34AA); Environmental Quality (Prescribed Conveyance) (Scheduled Wastes) Order 2005 (" <b>Prescribed Conveyance Order</b> ")	Department of Environment	<b>Environmental Approval:</b> 4 weeks	<i>What approvals are required to construct new pipelines for CO<sub>2</sub> transport? Are there any limitations? What environmental approvals are required?</i>  The construction of pipelines for transportation of CO <sub>2</sub> is not regulated in Malaysia.  <b>Environmental Approvals</b>  Under the EQA, no person shall carry out any work on any vehicle or ship that would cause the vehicle or ship to become a prescribed conveyance without the prior written permission of the Director General of the DOE.  Under the Prescribed Conveyance Order, any vehicle or ship of any description which is:  (a) propelled by a mechanism contained within itself; (b) constructed or adapted to be used on land or water; and (c) used for the movement, transfer, placement or deposit of scheduled wastes.  is a prescribed conveyance for the purpose of the EQA.  CO <sub>2</sub> is currently not listed as a "scheduled waste" under the EQA.  <b>Environmental Impact Assessment</b>  Please refer to the Pipelines - operating existing infrastructure section above for the requirements to commission an EIA Report for the construction of new pipelines for the transportation of CO <sub>2</sub> .	Although the definition of "pollutant" and "wastes" in the current environmental law regime of Malaysia can potentially cover CO <sub>2</sub> , no actual legal obligation exists unless and until acceptable conditions for CO <sub>2</sub> has been prescribed and regulated.  The requirement for planning approval is currently broad enough to cover the construction of pipelines for the transportation of CO <sub>2</sub> .

Issue	Area covered	Legal provisions	Competent authority	Timeline	Work needed to resolve issue	Potential legislative amendment/ Comment
		Town and Country Planning Act 1976 (" <b>TCPA</b> ") (Sections 19, 21, 21A)	Local Council	<b>Planning Approval:</b> Approximately 100 - 125 days (varies according to the local councils)	<p><b>Planning Approvals</b></p> <p>Under the Federal Constitution, the State Authority is responsible for the general policy in respect of the planning and development and use of all lands and buildings within the area of every local authority in the state.</p> <p>The TCPA, which is only applicable in Peninsula Malaysia defines "development" as the carrying out of any building, engineering, mining, industrial or other similar operations in, on, over or under land, or the making of any material change in the use of any buildings or other land, or the subdivision or amalgamation of lands.</p> <p>Under the TCPA, no person shall commence, undertake or carry out any development unless planning permission in respect of the development has been granted. An application for planning permission must be made to the relevant local authority using the prescribed form and shall be accompanied by such documents, plans and fees as may be prescribed. In the event that the applicant is not the owner of the land on which the development is to be carried out, the written consent of the owner must be obtained and endorsed on the application.</p> <p>In addition to the documents and plans to be submitted for planning permission, the applicant is also required to submit a development proposal report which shall contain the following:</p> <ul style="list-style-type: none"> <li>(a) the development concept and justification;</li> <li>(b) a location map and a site map;</li> <li>(c) particulars of land ownership and restrictions, if any;</li> <li>(d) (i) a description of the land including its physical environment, topography, landscape, geology, contours, drainage, water bodies and catchments and natural features thereon; (ii) a survey of the trees and all forms of vegetation; and (iii) particulars of a building, which may be affected by the development;</li> <li>(e) a land use analysis and its effect on the adjoining land;</li> <li>(f) layout plans, and</li> <li>(g) if specified by the state authority, an analysis of the social implications of the development for the area which is the subject of the application for planning permission.</li> </ul> <p>Note that a planning permission granted will lapse 12 months after the date of in which it was granted unless extended.</p>	

Issue	Area covered	Legal provisions	Competent authority	Timeline	Work needed to resolve issue	Potential legislative amendment/ Comment
2.1 E Pipelines - third party access and existing use rights	Transport - Design and Construction	What are the key sections of the relevant act?	Not applicable	Not applicable	<p><i>What access is available to third parties to pipeline infrastructure and associated land area? What is the impact of a new pipeline approval on existing use rights?</i></p> <p>Third parties access to pipeline infrastructure and associated land area is not regulated in Malaysia.</p>	

**TABLE 2.2: TRANSPORT - OPERATION**

Issue	Area covered	Legal provisions	Competent authority	Timeline	Work needed to resolve issue	Potential legislative amendment/ Comment
2.2 A Operation licence	Transport - Operation	<p>What are the key sections of the relevant act?</p> <p>Petroleum (Safety Measures) (Transportation of Petroleum by Pipelines) Regulations 1985 ("<b>PSM Regulations</b>") (Regulations 6)</p> <p>Gas Supply Regulations 1997 ("<b>GSR</b>") (Regulation 16, 17 and 18)</p>	<p>DOSH</p> <p>Energy Commission</p>	<p><b>Permission to Operate Pipelines:</b> 15 working days</p> <p><b>Approval to Operate Gas Installations:</b> 7 days</p>	<p><i>Is a licence required to operate a pipeline for the purpose of transporting CO<sub>2</sub>?</i></p> <p>The operation of pipelines for transportation of CO<sub>2</sub> is not regulated in Malaysia.</p> <p>However, the operation of pipelines for transportation of oil and gas is regulated.</p> <p><b>Permission to Operate Pipelines</b></p> <p>Under the PSM Regulations, no person shall operate any pipeline unless he or his representative has obtained a written permission from DOSH. In order to obtain the permission, the owner of his representative must submit the following:</p> <p>(a) a letter confirming that the material, design, construction, installation and testing of the pipeline comply with the requirements of the PSM Regulations and that the pipelines are safe to be operated;</p> <p>(b) a written emergency plan for implementation in the event of system failure, accident or other emergency. The plan shall include procedures for prompt and remedial action providing for the safety of the public and operating company's personnel, minimising property damage, protecting the environment and limiting accident discharge from pipeline; and</p> <p>(c) a letter confirming that the operating and maintenance procedures are based on the provisions of the American National Standard Institute Code or other alternative procedures.</p> <p><b>Approval to Operate Gas Installations</b></p> <p>Under Regulation 16 of the GSR, an Approval to Operate must be obtained from the Energy Commission upon completion of the installation work. Such approval can be obtained from the Director General by submitting a written application together with a Certificate of Completion issued and Test Certificate issued under the GSR.</p>	<p>The operation of oil and gas pipelines is regulated in Malaysia. It is possible that the regulatory regime for the operation of oil and gas pipelines be amended to include the transportation of CO<sub>2</sub>.</p>
2.2 B Liability for fugitive emissions	Transport - Operation	<p>What are the key sections of the relevant act?</p> <p>Environmental Quality Act 1974 (Section 22 and</p>	Department of Environment	Not applicable	<p><i>What is the liability for CO<sub>2</sub> released during the transportation stage?</i></p> <p>The operation of pipelines for transportation of CO<sub>2</sub> is not regulated in Malaysia. (See liability - failure to capture)</p> <p>There may be tortious action of nuisance may be available for</p>	<p>As above. If the acceptable conditions for CO<sub>2</sub> has been prescribed, and the emission of CO<sub>2</sub> exceeds the prescribed acceptable conditions, the DOE may order the plant owner to remedy the situation.</p>



		31)			<p>leakages of CO<sub>2</sub> during transportation.</p> <p>There is currently a restriction against emission or discharge of any environmentally hazardous substances, pollutants or wastes into the atmosphere in contravention of prescribed acceptable conditions. Where any environmentally hazardous substances, pollutants or wastes are being or are likely to be emitted, discharged or deposited from any vehicle, ship or premises or from any aircraft, the DOE may also by notice in writing require the owner or occupier of the vehicle, ship or premises, or aircraft, to:</p> <p>(a) install and operate any control equipment or additional control equipment;</p> <p>(b) repair, alter or replace any equipment or control equipment;</p> <p>(c) erect or increase the height of any chimney;</p> <p>(d) measure, take a sample of, analyse, record and report any environmentally hazardous substances, pollutants, wastes, effluents or emissions containing pollutants;</p> <p>(e) conduct a study on any environmental risk;</p> <p>(f) install, maintain and operate monitoring programme at the expense of the owner or occupier; or</p> <p>(g) adopt any measure to reduce, mitigate, disperse, remove, eliminate, destroy or dispose of pollution,</p> <p>within such time and in such manner as may be specified in the notice. Any person who contravenes the notice issued by DOE in this respect will be guilty of an offence and shall be liable to a fine not exceeding RM25,000 or imprisonment for a period not exceeding 2 years or to both. A further fine not exceeding RM1,000 a day for every day that the offence is continued after the service of notice shall also be imposed.</p>	
2.2 C Monitoring obligations	Transport - Operation	What are the key sections of the relevant act?	DOSH	Not applicable	<p><i>What are the monitoring obligations for pipelines?</i></p> <p>The requirement to monitor pipelines is not regulated by law. Based on no names enquiries made with the DOSH, the obligation to monitor, and the frequency of such monitoring of pipelines is within the discretion of the operators.</p>	In the event that the existing operation of oil and gas pipelines regime is amended to include transportation of CO <sub>2</sub> , provisions relating to the monitoring of such pipelines may also be included.
2.2 D Maintenance requirements	Transport - Operation	<p>What are the key sections of the relevant act?</p> <p>Petroleum (Safety Measures) Act 1984 ("<b>PSMA</b>"); Petroleum (Safety Measures)</p>	DOSH	Not applicable	<p><i>What are the on-going maintenance obligations? Is third party supervision required?</i></p> <p><b>Petroleum Pipelines</b></p> <p>Under the PSMA, it is provided that all the design, fabrication, installation, testing and the safety aspect of operation and maintenance of petroleum and gas pipeline shall meet the</p>	The operation of oil and gas pipelines is regulated in Malaysia. It is possible that the regulatory regime for the operation and maintenance obligations of oil and gas pipelines be amended to include the transportation of CO <sub>2</sub> .

2.2 D Maintenance requirements	Transport - Operation	<p>What are the key sections of the relevant act?</p> <p>Petroleum (Safety Measures) Act 1984 ("<b>PSMA</b>"); Petroleum (Safety Measures) (Transportation of Petroleum by Pipelines) Regulations 1985 ("<b>PSM Regulations</b>") (Regulation 9)</p> <p>Gas Supply Act 1993 ("<b>GSA</b>") (Section 25) ; Gas Supply Regulations 1997 ("<b>GSR</b>") (Regulation 128, 130, 129)</p>	DOSH	Not applicable	<p><i>What are the on-going maintenance obligations? Is third party supervision required?</i></p> <p><b>Petroleum Pipelines</b></p> <p>Under the PSMA, it is provided that all the design, fabrication, installation, testing and the safety aspect of operation and maintenance of petroleum and gas pipeline shall meet the requirements of the American National Standard Institute Code for:</p> <p>(a) Liquid Petroleum Transportation Piping System ANSI/ASME B31.4; or</p> <p>(b) Pressure Piping Gas Transmission and Distribution Piping System ANSI/ASME B31.8.</p> <p><b>Inspection by DOSH</b></p> <p>Pipelines are subjected to the inspection by the DOSH. The DOSH shall after considering any representation made by the owner or operator, determine the type of inspection and the interval between inspections. If during the inspection the inspector is of the opinion that the pipeline is likely to cause danger to life or damage to property, the inspector shall serve a notice in writing to the owner, operator or contractor requiring such defects to be made good or removed within such period as may be specified (hereinafter referred to as "<b>grace period</b>") and such part shall not be used after such grace period unless the defect has been made good or removed to the satisfaction of the inspector. If the pipeline is likely to cause immediate danger to life and property, the inspector shall, without waiting for a notice to be served, immediately prohibit the installation or operation of such part of the pipeline until the defect is made good or removed to the satisfaction of the inspector.</p> <p><b>Gas Pipelines</b></p> <p><u>Maintenance Requirement</u></p> <p>It is a legal requirement under the GSR that a gas installation be maintained in good and efficient working order to ensure safety of persons and safety shall be observed at all times so as to prevent danger from arising.</p> <p>Note that only a competent person or a person acting under the immediate supervision of a competent person shall undertake to carry out the repair and maintenance of a gas pipeline or gas installation.</p> <p>Under the GSA, it is stipulated that where it is necessary to do so for the purpose of maintaining, repairing or upgrading any pipeline or installation, the licensee, or any person authorised by</p>	<p>The operation of oil and gas pipelines is regulated in Malaysia. It is possible that the regulatory regime for the operation and maintenance obligations of oil and gas pipelines be amended to include the transportation of CO<sub>2</sub>.</p>
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TABLE 2.3: TRANSPORT - DECOMMISSIONING

Issue	Area covered	Legal provisions	Competent authority	Timeline	Work needed to resolve issue	Potential legislative amendment/ Comment
2.3 A Decommissioning obligation	Transport - Decommissioning	What are the key sections of the relevant act?	Not applicable	Not applicable	<p><i>Are there any legal requirements to decommission a pipeline after a certain amount of time?</i></p> <p>There is no legal obligation to decommission a pipeline in Malaysia.</p>	
2.3 B Contaminated lands	Transport - Decommissioning	<p>What are the key sections of the relevant act?</p> <p>Petroleum (Safety Measures) (Transportation of Petroleum by Pipelines) Regulations 1985 ("<b>PSM Regulations</b>") (Regulation 13)</p>	DOSH	Not applicable	<p><i>Are pipeline owners/operators required to monitor or report on land contamination? Are they required rehabilitate land?</i></p> <p>There is no legal obligation on pipeline owners / operators to monitor or report on land contamination in Malaysia.</p> <p><b>Petroleum Pipelines</b></p> <p>Note however that under the PSM Regulations, the owner, operator or contractor of a pipeline operator or his authorised representative is required to immediately notify the DOSH of:</p> <p>(a) any dangerous occurrence which may affect the safety of any pipeline while it is being installed or operated; and</p> <p>(b) any gas leak which:</p> <ul style="list-style-type: none"> <li>(i) causes death or personal injury requiring hospitalisation of any person;</li> <li>(ii) requires the taking of any segment of a pipeline out of service;</li> <li>(iii) results in gas ignition; or</li> <li>(iv) represents an existing or probable hazard to person or property.</li> </ul> <p>The owner or operator of a pipeline is also required under the PSM Regulations to, as soon as he becomes aware of any defect in the pipeline or any circumstance which would affect the safety of the pipeline:</p> <p>(a) rectify the defect or circumstance so as to ensure the safety of the pipeline; or</p> <p>(b) cease to operate the pipeline if the defect or circumstance cannot be made good or removed and inform the DOSH.</p>	It is possible that the regulatory regime for the operation and maintenance obligations of oil and gas pipelines be amended to include the transportation of CO <sub>2</sub> .
2.3 C Insolvency event	Transport - Decommissioning	What are the key sections of the relevant act?	Not applicable	Not applicable	<p><i>Who takes responsibility for maintenance and decommissioning of pipelines in the event of insolvency of the pipeline operator?</i></p> <p>The maintenance and decommissioning of pipelines is not regulated in Malaysia.</p>	

**TABLE 3.1: STORAGE - DESIGN AND CONSTRUCTION**

Issue	Area covered	Legal provisions	Competent authority	Timeline	Work needed to resolve issue	Potential legislative amendment/ Comment
3.1 A Surface and sub-surface rights - who owns CO <sub>2</sub> ?	Design and Construction	Not applicable			<p><i>Who owns CO<sub>2</sub> that is to be stored? Is that ownership transferred after period of time?</i></p> <p>There is no legislation governing the ownership of CO<sub>2</sub> at the moment.</p>	<p>The importance of developing legislation in this area is because liability would be a key issue in the event of emission discharge or further environmental issues developing as a result of the CO<sub>2</sub> storage. The owner of CO<sub>2</sub> may be liable for any environmental hazard or pollution caused as a result of negligent or accidental transport, injection or storage issues.</p> <p>The question is whether the capturing plant will be responsible for the transportation of the CO<sub>2</sub> to the storage site or if this will be the responsibility of existing oil &amp; gas companies which are likely to be the storage site operator. Ownership of CO<sub>2</sub> can be decided and imposed upon the relevant party once the above can be answered.</p> <p>The transportation of CO<sub>2</sub> can of course be outsourced to third party operators. Where transport of other materials is outsourced, the usual practice is for the transporter to have a contractual obligation to transport a substance for its owner. By analogy, the ownership of the CO<sub>2</sub> would likely reside with either the capturing plant or the storage operator.</p> <p>Listed below are scenarios the Ministry may consider in deciding in whom the CO<sub>2</sub> ownership vests:</p> <p>a) If it is decided that the power plant operators should capture, transport and store the CO<sub>2</sub>, then ownership in the CO<sub>2</sub> should be vested in the power plant operators</p> <p>b) If it is decided that the power plant operators should capture the CO<sub>2</sub> only and a third party is responsible for the transportation and storage of the CO<sub>2</sub> (e.g. storage licensee), then ownership in the CO<sub>2</sub> should be transferred from the power plant operators to the third party once the title to the CO<sub>2</sub> is passed to this third party.</p>

						<p>c) If it is decided that an independent third party should be commissioned to handle the capturing, transporting and storing of the CO<sub>2</sub>, then ownership of the CO<sub>2</sub> will pass when the third party carries out the capturing phase of the CCS project.</p> <p>Furthermore, in developing this legislation on ownership of CO<sub>2</sub> there should be a provision detailing the act which constitutes the passing of CO<sub>2</sub> ownership from one party to the other. E.g. ownership passes when the CO<sub>2</sub> enters the transportation device (underground pipes, tanker pipes or any other mechanism used to transport the CO<sub>2</sub>).</p> <p>Another consideration is the duration of the ownership once the CO<sub>2</sub> is stored underground. The corporation of the storage operators may be wound up at some point over the duration of the storage should leakages or accidents occur during storage. The Ministry should consider if, after a sufficient period of storage time, or the occurring of certain events (like the dissolution of the corporation of the storage site operator, etc.), CO<sub>2</sub> ownership may be transferred to the Government.</p>
3.1 B Surface and sub-surface rights - who owns pore space?	Design and Construction	National Land Code (" <b>NLA</b> ") (Sections 2 and 40); Petroleum Mining Act 1966 (" <b>PMA</b> ") (Section 4(1)); Petroleum Development Act 1974 (" <b>PDA</b> ") (Sections 2, 3 and 8)	State Authority	Not Applicable	<p><u>Surface Rights?</u></p> <p>The NLA defines "land" as:</p> <p>(a) the surface of the earth and all substances therein;  (b) the earth below the surface and all substances therein.  Section 40 of the NLA goes on to state that "the State owns the entire property in all State land and all minerals and rock material within or upon the land."</p> <p>Therefore, surface rights are vested in the SA.</p> <p><b>Subsurface rights</b></p> <p>A reading of Section 40 of the NLA above indicates that the State owns the entire property in the "earth below the surface and all substances therein". Therefore, subsurface rights would also vest in the SA.</p> <p>However, it should be noted that in the case of oil and gas (which are minerals in the ground), SA does not have ownership of such minerals. The basis for this lies in Section 2 of the PDA which states that:</p> <p>"entire ownership in, and exclusive rights, powers, liberties and</p>	<p>The provisions contained in the NLA indicate that there may not be a need to further develop the existing clauses or create new clauses to identify subsurface ownership rights. However, to increase clarity in this area, the definition of "land" could be amended to include the pore space within the subsurface.</p>

					<p>privileges of exploring, exploiting, winning and obtaining petroleum whether onshore or offshore of Malaysia shall be vested in a Corporation to be incorporated under the Companies Act 1965 or under the law relating to incorporation of companies".</p> <p>Section 3 PDA names that Corporation as "PETRONAS".</p> <p>Therefore, the SA owns the surface and subsurface rights but petroleum underground is owned by PETRONAS. It is possible to infer that since the SA owns all surface and subsurface rights and PETRONAS' ownership only extends to the petroleum within the ground, pore space ownership would still be vested in the SA.</p> <p>Rights may be transferred to the Federal Government in certain circumstances. Section 76 of the NLA provides that the land may be disposed by the SA to the Federal Government in perpetuity where:</p> <p>(a) the Federal Government requires the SA to cause a grant in perpetuity to be made to the Federal Government or to a public authority or where the Federal Government and the Government of the State agree to make a grant in perpetuity to the Federal Government;</p> <p>(b) where the SA is satisfied that the land is to be used for a public purpose; or</p> <p>(c) where the SA is satisfied that there are special circumstances which render it appropriate to do so.</p>	
3.1 C Surface and sub-surface rights - access to surface infrastructure?	Design and Construction	Petroleum Mining Act 1966 (" <b>PMA</b> ") (Sections 7(1), 22 of Schedule 2); Petroleum Development Act 1974 (" <b>PDA</b> ") (Section 3); Petroleum Regulations 1974 (" <b>PR</b> ") (Regulations 3 and 5); National Land Code (" <b>NLC</b> ") (Section 40); Mineral (Selangor) Enactment 2000 (" <b>MSE</b> ") (Sections 3, 4 and 41)	PETRONAS	Not Applicable	<p><u>Does a person need to own land on which project is being conducted? Grant of easement or certain type of lease?</u></p> <p>There is currently no legislation in Malaysia stipulating that the operator of a project would need to own the land upon which his/her/their project is being conducted.</p> <p><u>What happens if project is in conflict with existing land use rights? Is third-party access permitted?</u></p> <p>One area in which the CO<sub>2</sub> could be stored is the depleted oil and gas reservoirs within Malaysia. The conflicts of land use which may arise include, but are not limited to:</p> <p>(a) Storage sites which encompass areas of land containing petroleum not yet mined by PETRONAS;</p> <p>(b) Exploration licenses granted to one party which may interfere with the operation of the other party; or</p> <p>(c) The use of infrastructure or equipment which may deter one party from performing its functions such as the construction of underground pipelines by the CO<sub>2</sub> storage site owner which may interfere or hinder the process of extracting petroleum by PETRONAS or vice versa..</p> <p>Section 22 of PMA provides that:</p>	<p>Both petroleum mining and CO<sub>2</sub> storage serve a national purpose.</p> <p>For issues relating to storage site and surface or sub-surface rights for carbon storage, we are of the view that a new set of rules should be considered and these rules should include among other things:</p> <p>a) priority of rights to the potential storage site between PETRONAS and CO<sub>2</sub> storage parties;</p> <p>b) the issue of timings of access onto the site; and</p> <p>c) whether there should be a clause allowing CO<sub>2</sub> storage parties to carry out petroleum extraction in storage areas licensed to them for the benefit of PETRONAS (this has been considered and adopted in Australia).</p>



					<p>"Any person or persons authorised by the Petroleum Authority shall be entitled at all reasonable times to enter into or upon any of the licensee's installations and equipment used or to be used in connection with searching for petroleum in the exploration area for the purposes herein mentioned: (a) to examine the installations, wells, plant, appliances and works made or executed by the licensee in pursuance of this licence and the state of repair and condition thereof; and</p> <p>" to execute any works or to provide and install any equipment which the Petroleum Authority may be entitled to execute or provide and install in accordance with this licence". PDA and PR designates PETRONAS as the body issuing licences to bodies or entities interested in exploring or mining petroleum."</p> <p>Petronas is subject to the control and direction of the Prime Minister who may from time to time issue such direction as he may deem fit. The direction so issued shall be binding on Petronas.</p> <p>Based on the above provisions, the PMA provides for third party access into the area in which the licensee of a petroleum agreement operates for the purposes of executing or installing any works or equipment which the Petroleum Authority may be entitled to execute or provide under the licence. PETRONAS has the power to deal with the conflicts which may arise from the access to infrastructure. The Prime Minister may issue a binding direction for PETRONAS to incorporate within its licences and contracts with all petroleum prospectors, explorers and miners, a clause allowing CO<sub>2</sub> storage parties to enter onto the licensee's designated area at a reasonable time to execute their CO<sub>2</sub> storage work or installing their storage site equipment.</p> <p>Aside from PETRONAS, there are other parties who may have surface rights over the land and the CCS project may come into conflict with such rights. Examples of such situations are: (a) Business premise owners on the surface of land; (b) Residential areas close to the CCS site; or (c) It is a public access road for pedestrians or transportation.</p> <p>Under the NLA, it is possible under Section 92A to 92G for the State Authority to specify underground land rights upon alienation of the land. In doing so, the State Authority may specify the minimum depth of land to which the underground rights apply, the conditions to be attached to the grant of such rights, the removal, relocation and re-laying of any piping, drainage, cables, wirings, etc. the use of the land and further conditions for the protection of environmental and State rights.</p> <p>"Underground land" means land which lies below the surfaces of the earth.</p>	
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					<p>Although this concept is not utilised very much in Malaysia, the legislation provides the possibility for exercise of such powers by the State Authority. It should be noted that the legislation is however silent on situations involving conflicts of rights in the use of the land between the underground land rights and the surface land rights holder.</p>	
3.1 D Exploration permit	Design and Construction	<p>Petroleum Mining Act 1966 ("<b>PMA</b>") (Sections 7(1), 22 of Schedule 2); Petroleum Development Act 1974 ("<b>PDA</b>") (Section 3); Petroleum Regulations 1974 ("<b>PR</b>") (Regulations 3 and 5); National Land Code ("<b>NLC</b>") (Section 40); Mineral (Selangor) Enactment 2000 ("<b>MSE</b>") (Sections 3, 4 and 41)</p>	PETRONAS	<p><b>Exploration Licence for Petroleum:</b> 1 and 1/2 to 2 months</p>	<p><u><i>Is a exploration permit required to undertake subsurface storage exploration? How is it acquired?</i></u></p> <p>There are no laws in Malaysia governing exploration permits for CO<sub>2</sub> storage licensees (or other non-commercial resources). There is likely to be a need for exploration permits because CO<sub>2</sub> storage parties would need to survey the geological formations, including their interaction with existing resources and petroleum reservoirs to determine the suitability of the site as a CO<sub>2</sub> storage facility.</p> <p><b>Petroleum reservoirs</b></p> <p>Petroleum reservoirs in Malaysia are located offshore and the PMA and PDA apply to onshore and offshore petroleum reserves. Therefore, an analogy for the manner in which exploration licence is granted under PMA and PR for petroleum exploration can be drawn for the purpose of developing CCS legislation.</p> <p>Section 7(1) of PMA gives the authority to PETRONAS to issue an exploration licence in respect of the whole or any part of the area of the land applied for, provided that:</p> <p>(a) an exploration licence shall not be issued in respect of an area of land which has already been covered by a petroleum agreement; and</p> <p>(b) nothing in this section shall prevent the Petroleum Authority from issuing in respect of the same area of land more than one exploration or another exploration licence or licences to other person or persons."</p> <p><u>Scope of Exploration Permit</u></p> <p>Section 6 of Schedule 2 PMA provides that:</p> <p>"The right to search for petroleum conferred by this licence shall include prospecting and carrying out geological surveys by geophysical, topographic and chemical means and drilling for the purpose of obtaining geological information about strata in the exploration area but shall not include any right to get petroleum or any right to drill wells for production of petroleum."</p> <p><u>Procedure for Permit Application</u></p>	<p>A new Authority regulating and coordinating the exploration of a potential CO<sub>2</sub> storage site may be considered. This new Authority, like PETRONAS, could also be the licensing authority for CCS exploration permits.</p> <p>Alternatively this function could be given to an existing agency with relevant technical expertise, such as the Minerals and Geoscience Department under the Ministry of Natural Resources and Environment or the Ministry of Energy, Green Technology and Water.</p>

			State Mineral Resources Committee	<p>The Federal Government has assigned rights and ownership in petroleum to PETRONAS. Regulation 3 of PR states that "a licence to commence... any business of service, onshore or offshore relating to the exploration, exploitation, winning and obtaining of petroleum and, in particular involving the supply and use of rigs, derricks, ocean tankers and barges" shall be made to the President of PETRONAS.</p> <p>The Chairman and Chief Executive of PETRONAS shall process applications made to them and thereafter forward them to the Prime Minister for approval.</p> <p><u>Terms and Conditions of Exploration Permit</u></p> <p>Some of conditions that relate to an exploration licence found in Regulation 5(3) of PR are (but not limited to):</p> <ul style="list-style-type: none"> <li>(i) royalties, bonuses, levies or other such payments;</li> <li>(ii) fees as specified in the Schedule;</li> <li>(iii) work and investment programme;</li> <li>(iv) method of working;</li> <li>(v) inspection of worksite and plant;</li> <li>(vi) employment and training; and</li> <li>(vii) submission of all data, information and records connected in any survey or research</li> </ul> <p><b>Mineral reservoirs</b></p> <p>CO<sub>2</sub> may also be stored onshore in mineral ore reservoirs (i.e. un-minable coal beds). Legislation relating to mineral exploration licences may be of use in developing CCS legislation for onshore storage.</p> <p>The Section 40 of the NLA states that "the State owns the entire property in all State land and all minerals and rock material within or upon the land."</p> <p>Therefore, the State regulates the licensing and the movement of mineral ores within the State. Each State has a separate regime put in place to regulate the exploration and mining of mineral ores within the State. The MSE governing the exploration, mining and movement of mineral ores within Selangor will be used here for illustration purposes.</p> <p><u>Ownership of Mineral Ores</u></p> <p>Section 3 of MSE states that, "there is and shall be vested solely in the State Authority all minerals within or upon any land, including so much of the bed of any river, and of the foreshore and bed of the sea, as is within the territories of the State or the limits of the territorial waters if they have not been specifically disposed of by the State Authority in accordance with the provisions of this Enactment or any other written law".</p>	
				<p><b>Exploration Licence for</b></p> <p><u>Procedure for Exploration Licence for Mineral Ores</u></p>	

		<p>Geological Survey Act 1974 (Section 5,6,7,8,12 and 14)</p>	<p>Director General of Geological Survey</p>	<p><b>Mineral Ores:</b> 3 months to 6 months</p> <p><b>Notification:</b> <b>Generally two weeks for permission to dig; 1 month for permission to dig a well. The timeline also depends on the yield.</b></p>	<p>An application for a prospecting licence or exploration for licence shall be made to the State Authority in the prescribed form. Upon receipt of an application, the State Authority shall refer the application to the State Mineral Resources Committee for its recommendation.</p> <p>The State Mineral Resources Committee shall, as soon as practicable after considering the application, transmit to the State Authority its report and recommend whether the application should be:</p> <p>(a) approved, in whole or in part  (i) confirming that the applicant has complied with the requirements of MSE; and  (ii) specifying the terms or conditions subject to which the prospecting licence or exploration licence, as the case may be, is to be granted; or  (b) refused.</p> <p>The State Authority may then approve or refuse the application whether or not the State Mineral Resources Committee recommends the approval of the application or the refusal thereof and the decisions of the State Authority shall be final.</p> <p><b>Geological Survey</b></p> <p>Under the Geological Survey Act 1974, the Director General of Geological Survey may authorize any Geological Survey Officer to undertake consultation, analysis or other service for any other person. The authorized person may however need to obtain the written approval of the proprietor or occupier of all land onto which he requires to enter, and to obtain such permits and authority as may be necessary under any law for the purpose of the consultation, analysis or other service.</p> <p>The area of land on which the geological survey is required may be designated as the survey area. The Geological Survey Officer or an authorized person will then have power to enter any land within the designated area for the purpose of geological survey. The powers granted for this purpose include:</p> <p>(a) enter upon any land within the designated area;</p> <p>(b) cut, remove or otherwise clear such uncultivated vegetation as may be necessary for the proper conduct of such survey;</p> <p>(c) erect or emplace such pegs and marks as may be necessary for the proper conduct of such survey;</p> <p>(d) conduct a superficial geological survey;</p> <p>(e) conduct an artificial geophysical survey;</p> <p>(f) bore, drill, fracture, dig or pit over the land;</p>	
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					<p>(g) obtain and remove any specimen or sample from the land in furtherance of such survey and remove and dispose of as the Geological Survey Officer deems fit Superficial or cognate material as may be necessary to obtain the specimen or sample.</p> <p>Although this is set out in the legislation, in practice, a geological survey is made as part of the Permission to Build (or Development Order). The local authority issuing the Permission to Build, as part of the procedure, will request the Minerals and Geoscience Department to do the Geological Survey. The Minerals and Geoscience Department will then give the review of the geological survey to the local authority. So, there is usually no need for the applicant to apply for a geological survey.</p> <p>In any other case, any person who bores, drills, digs or otherwise develops a well for the purpose of searching for or extracting water therefrom shall notify the Director General of Geological Survey of such details. This does not include a well which is less than 30 feet in depth without reaching bedrock or yield less than 500 gallons of water per day.</p> <p>Further, any person who bores, drills, digs or otherwise develops a hole, pit, shaft, tunnel, cutting or other excavation exposing bedrock (as distinct from alluvium or detritus) shall also notify the Director General of Geological Survey of such details.</p>	
3.1 E Test injection permit	Design and Construction	Environmental Quality Act 1974 ("EQA") (Sections 10, 11(3), 24); Environmental Quality (Prescribed Premises) (Scheduled Wastes Treatment and Disposal Facilities) Order 1989	Department of Environment	<b>Pollution Licence:</b> around 1 month	<p><u>Is a permit required to conduct injection testing? How is it acquired?</u></p> <p>There are no express laws in Malaysia governing injection testing permits for CO<sub>2</sub> storage licensee.</p> <p>The test injection phase involves the injection or insertion of a small quantity of CO<sub>2</sub> within the ground to assess the suitability of the storage site. This would be one of the operations conducted during the exploration phase.</p> <p>As discussed above, Section 24 of the EQA provides that no person shall, unless licensed, pollute or cause or permit to be polluted any soil or surface of any land in contravention of the acceptable conditions specified under section 21. A person shall be deemed to pollute any soil or surface of any land if he places in or on any soil, or in any place where it may gain access to any soil, any matter whether liquid, solid or gaseous. At present, CO<sub>2</sub> is not classified as a pollutant, however, we note that the definition of "pollutant" is very broad under the EQA and may encompass CO<sub>2</sub>. The EQA further provides that the Director General has the power to attach conditions to the licence and these conditions may involve, but are not limited to, the installation of control equipment and the design of a monitoring programme at the</p>	<p>The matter that has been detailed in the left column is in relation to environmental permits with regards the test injection phase. CCS projects conducted in Australia and other countries have a test injection permit or licensing scheme which must obtain approval from the same authority that granted them their exploration licence. This may be considered for the development of CCS legislation in Malaysia.</p> <p>There are two options that have been implemented in Australia and other CCS implementing countries:</p> <p>a) The exploration permit not only covers the geological survey of the potential storage site area, it also covers the test injection of CO<sub>2</sub> into the pore space of the survey area;</p> <p>b) The exploration permit is separated from the test injection permit. A CO<sub>2</sub> storage party wishing to inject small quantities of CO<sub>2</sub> into the subsurface area would require a research permit and that permit would be obtained</p>

					<p>licensee's expense. Therefore, the CO<sub>2</sub> storage party may obtain a licence from the Director General with the stated conditions attached to it.</p> <p>As is detailed in the above provisions, any licence granted by the Director General is contingent on it not interfering or contravening any town or local authority planning scheme. This is dealt with in the following section.</p>	<p>from the same authority that issued the exploration permit.</p> <p>Alternatively, the licensing for test injection can be embedded in the existing EQA regime by prescribing the acceptable conditions for CO<sub>2</sub>. Emission of CO<sub>2</sub> exceeding the acceptable conditions, including the injection of CO<sub>2</sub> underground, can be expressly regulated by DOE.</p>
3.1 F Planning approval requirements	Design and Construction	Environmental Quality Act 1974 ("EQA") (Sections 19, 20(1), 34A); Environmental Quality (Prescribed Premises) (Scheduled Wastes Treatment and Disposal Facilities) Order 1989 ("EQ(PP)(SW)O") (Order 3)	Department of Environment	Not applicable	<p><u><i>Is planning or development approval required for a storage facility/site? What are the environmental impact and other reporting obligations?</i></u></p> <p><b>Environmental approvals</b></p> <p>Section 19 of the EQA states that no person shall:</p> <p>(a) carry out any work on any vehicle or ship, or premises that would cause the vehicle or ship, or premises to become a prescribed conveyance or prescribed premises, as the case may be; or</p> <p>(b) construct on any land or any building designed for or used for a purpose that would cause the land or building to become prescribed premises, without the prior written permission of the Director General.</p> <p>Order 3 of the EQ(PP)(SW)O provides that an "off-site storage facility" is a prescribed premise. Off-site storage facility means premises occupied or used for the storage, collection or transfer of any scheduled waste which is not produced on those premises.</p> <p>CO<sub>2</sub> is not currently considered 'scheduled waste'.</p> <p><b>Environmental Impact Assessment</b></p> <p>As discussed above, "prescribed activities" would require the submission and approval of EIA report by DOE. Construction of product depots for the storage of petrol, gas or diesel which are located within 3 km of any commercial, industrial or residential areas and which have a combined storage capacity of 60,000 barrels or more will be considered "prescribed activities".</p> <p>Further, construction of off-site storage facility for toxic and hazardous waste also constitutes a "prescribed activity". CO<sub>2</sub> has not been defined as a toxic or hazardous waste. However, in large quantities, CO<sub>2</sub> has been proven to be toxic and hazardous.</p>	<p>Although no specific environmental approval is required, it appears that the construction and development of a storage site would be "prescribed activities" which require submission of EIA Report.</p>

		<p>Town and Country Planning Act 1976 ("TCPA") (Sections 20, 21, 21A, 105); Street, Drainage and Building Act 1974 ("SDBA") (Sections 70, 70A, 50 and 51); Building Order 1994 ("BO") (Sections 3 and 8); Waters Act 1920 ("WA") (Section 3, 7 and 8); Electricity Supply Act 1994 ("ESA") (Section 1 and 2)</p>		<p><b>Storage Site Planning Approval</b></p> <p><u>Planning Permission</u></p> <p>An application for planning permission in respect of a development shall be made to the local planning authority and shall be in such form and shall contain such particulars and be accompanied by such documents, plans, and fees as may be prescribed.</p> <p>If the applicant is not the owner of the land on which the development is to be carried out, the written consent of the owner thereof to the proposed development shall be obtained and endorsed on the application.</p> <p>Further details of the planning permission have been discussed above.</p> <p>It should also be noted that the TCPA applies to Peninsular Malaysia and not East Malaysia.</p> <p><u>Buildings, Drainage and Earthworks</u></p> <p>SDBA regulates the obtaining of approvals and permissions from local authorities in states within Peninsular Malaysia for the purpose of constructing, maintaining and repairing streets, drainage and buildings.</p> <p>Please refer to the land development approval section at "construction - design and approval" for further details.</p> <p>Note that if the local authority does not, within three calendar months from the date of the submission of any plans or specifications or from the date of resubmission of such plans amended, as the case may be, approve, disapprove or make written requisition with regard thereto, the principal submitting person or submitting person may apply to the State Authority, and the power vested in the local authority shall then vest in the State Authority.</p> <p>Section 51(3) of the SDBA provides that, the local authority may, with the approval of the State Authority, if satisfied that any proposed development in any area, existing surface or storm water drains, culverts, gutters or water-courses will have to be improved, require any developer in that area to deposit such sum as may be apportioned by the local authority before proceeding to develop that area, provided that the developer may, if the local authority so agrees, instead of depositing a sum of money give a security to the satisfaction of the local authority.</p> <p>Therefore, the CO<sub>2</sub> storage site owners would potentially need to deposit a sum of money with the local authority or provide security to the satisfaction of the local authority for the</p>	<p>Where there are potential conflicts between land or resource ownership and the use of an area for geological storage agreements may need to be negotiated. For example, in Australia injection and storage licences will only be granted where the consent of other resource holders has been obtained (which may involve a mediation process with the Regulator).</p> <p>In Malaysia, with offshore storage, resource conflicted could arise with those persons who have fishing rights and potentially with PETRONAS (if it is not the party undertaking the storage).</p> <p>Schedule 2, Section 14 of the PMA provides that, "The licensee shall not carry out any operations authorized by this licence in or about the exploration area in such manner as in the opinion of the Petroleum Authority to interfere unjustifiably with navigation or fishing in the waters of the exploration area or with the conservation of the living resources of the sea."</p> <p>It is unlikely that permission would be granted for CO<sub>2</sub> storage in areas where viable petroleum resources can be exploited. However, in some instances CO<sub>2</sub> injection associated with enhanced oil recovery could be undertaken. This would likely be undertaken by, or done in collaboration with PETRONAS.</p>
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		<p>Federal Constitution, Schedule 9, List III</p> <p>Environmental Quality Act 1974, Section 25</p> <p>Geological Survey Act 1974, Section 13</p>		<p>purposes of constructing a drainage system for the storage site.</p> <p><u>Waters</u></p> <p>WA is the legislation governing rivers in the States of Negeri Sembilan, Pahang, Perak, Selangor, Malacca, Penang and Federal Territory.</p> <p>Please refer to the land development approval section at "construction - design and approval" for further details.</p> <p>Therefore, the relevant licence to divert the waters from rivers to the storage site would need to be obtained from the State Authority or District Officer and that licence may extend to an authorisation for the building of pipes and such to facilitate the diversion of the water from the river.</p> <p>The Federal Constitution does not make any specific provisions for groundwater and as previously discussed, "water" and "land" falls under State law regime. However, List III Concurrent List of the Federal Constitution states that "drainage and irrigation" can be legislated by both, the Federal and State Government.</p> <p>Utilising groundwater or underground saline aquifers to store CO<sub>2</sub> (which falls within the definition of "pollutant" under EQA) may constitute "pollution". The EQA provides that,</p> <p>"No person shall, unless licensed, emit, discharge or deposit any environmentally hazardous substances, pollutants or wastes into any inland waters in contravention of the acceptable conditions specified under section 21."</p> <p>Furthermore, the EQA specifies that,</p> <p>"a person shall be deemed to emit, discharge or deposit wastes into inland waters if:</p> <p>(a) he places any wastes in or on any waters or in a place where it may gain access to any waters;</p> <p>(b) he places any waste in a position where it falls, descends, drains, evaporates, is washed, is blown or percolates or is likely to fall, descend, drain, evaporate or be washed, be blown or percolated into any waters, or knowingly or through his negligence, whether directly or indirectly, causes or permits any wastes to be placed in such a position; or</p> <p>(c) he causes the temperature of the receiving waters to be raised or lowered by more than the prescribed limits."</p>	<p>There is no definition of "groundwater" in Malaysian legislation (although the concepts of groundwater and saline aquifers are clearly explained in the Mineral and Geoscience Department's website, with groundwater being used for drinking, agriculture and industry).</p> <p>The term "inland waters" is used in the EQA and is defined as "any reservoir, pond, lake, river, stream, canal, drain, spring or well, or any part of the sea above the low water line along the coast, or any other body of natural or artificial surface or subsurface water".</p> <p>This definition would include groundwater and therefore the pollution provision under the EQA would apply to groundwater as well. It should be noted that the definition of "inland waters" does not draw a line between groundwater and saline aquifer and the definition is broad enough to include saline aquifers as it merely states that inland waters include subsurface water.</p> <p>DOE has established national groundwater monitoring programme to monitor groundwater and to ensure that it complies with the Ministry of Health's National Guidelines for Raw Drinking Water Quality.</p>
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					<p>"Inland waters" is defined in the EQA as any body of artificial or natural surface or subsurface water.</p> <p>If the "acceptable conditions" for CO<sub>2</sub> is prescribed as suggested, a license to interfere with groundwater should be obtained from the Director General of Environmental Quality.]</p>	
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TABLE 3.2: STORAGE - OPERATION (INJECTION)

Issue	Area covered	Legal provisions	Competent authority	Timeline	Work needed to resolve issue	Potential legislative amendment/ Comment
3.2 A Classification of CO <sub>2</sub> - licencing requirements	Operation - Injection	Environmental Quality Act 1974 ("EQA") (Sections 2 and 51)	Department of Environment; Ministry of Natural Resources and Energy ("MNRE")	Not Applicable	<p><u>How is CO<sub>2</sub> classified under Malaysian Law? Is it a pollutant etc? Are there any licencing requirements? Does the injection of CO<sub>2</sub> constitute a polluting activity? Is a special exemption needed?</u></p> <p>CO<sub>2</sub> is not classified under Malaysian law.</p> <p>Please refer to Classification of CO<sub>2</sub> - Licensing Requirements section at "Construction - Operation" for further details.</p> <p>The Minister of Energy, Green Technology and Water may by regulations specify the acceptable conditions for the emission, discharge or deposit of pollutants, wastes or environmentally hazardous substances or emission of noise into any area, segment or element of the environment and may set aside any area, segment or element of the environment within which the emission, discharge or deposit is prohibited or restricted. Any person who contravenes the acceptable conditions will commit an offence unless a licence has been obtained.</p>	
3.2 B Storage licence	Operation - Injection	Not Applicable	Who decides on approval	<p>Environmental Quality (Prescribed Premises) (Scheduled Waste) Order 2005, Order 5 ("EQ(PP)(SW) O")</p> <p>Environmental Quality (Control of Pollution from Solid Waste Transfer Station and Landfill) Regulations 2009, Regulation 4 ("EQ(Solid Waste Transfer Station and Landfill)R")</p>	<p><u>Is a storage or injection licence required in order to store CO<sub>2</sub> at a site? What is the process for acquiring one? What requirements or conditions are placed on injection?</u></p> <p>There are no laws in Malaysia governing storage or injection licences to store CO<sub>2</sub> at a site or for the liquefaction and storage of other gaseous fuels such as LNG below ground. However, laws governing the transport and storage of waste and hazardous substances may provide insights into future CCS legislation.</p> <p>Solid waste transfer stations and landfills are regulated under the Environmental Quality (Control of Pollution from Solid Waste Transfer Station and Landfill) Regulation 2009 ("<b>Regulation 2009</b>"). The discharge or release of "leachate" (which is defined in the Regulation 2009 as "liquid that has percolated through solid waste and has been extracted or dissolved, or suspended materials from the solid waste, or liquid discharged or released from a solid waste transfer station or landfill) is also regulated under the Regulation 2009.</p> <p>No person shall, without the prior written notification to the Director General of Environmental Quality, carry out any work on any solid waste transfer station or landfill, or construct on any land any facility or building that may result in a new source of</p>	<p>The storage permit should make comprehensive provisions, among others things, for:</p> <ul style="list-style-type: none"> <li>a) Areal extent and stratum injection;</li> <li>b) Injection rate and total volume per annum;</li> <li>c) Injection pressure;</li> <li>d) Injection period;</li> <li>e) Monitoring, reporting and verification requirements;</li> <li>f) Emergency response; and</li> <li>g) Financial security requirements.</li> </ul>

Issue	Area covered	Legal provisions	Competent authority	Timeline	Work needed to resolve issue	Potential legislative amendment/ Comment
					<p>leachate discharge or release.</p> <p>Any person may apply for a licence under subsection 25(1) of the EQA from the Director General of Environmental Quality to contravene the acceptable conditions of discharge of leachate as specified in in the Regulation 2009.</p> <p>The owner and occupier of a solid waste transfer station or landfill shall operate the solid waste transfer station or landfill in such manner that the following are strictly controlled:</p> <p>(a) noise, dust or odours;</p> <p>(b) air pollution;</p> <p>(c) pollution of the soil, surface water or ground water; and</p> <p>(d) entry and disposal of scheduled wastes.</p> <p>The owner and occupier also has the responsibility to:</p> <p>(a) ensure that the design and operation of the landfill incorporates measures to prevent and control the pollution to ground water; and</p> <p>(b) establish and operate a ground water monitoring program to monitor the leakages or movement of leachate from the landfill.</p>	
3.2 C Duration of licence	Operation - Injection	Not Applicable	Not Applicable	Not Applicable	<p><u>What is the term of the licence? Can it be extended?</u></p> <p>There are no regulations on licence terms for storage or injection of CO<sub>2</sub> in storage sites.</p>	
3.2 D Monitoring and verification	Operation - Injection	Section 34A of the Environmental Quality Act 1974 ("EQA")	Department of Environment	Not Applicable	<p><u>What are the on going monitoring and verification requirements? Is a monitoring plan required? Must it gain pre-approval?</u></p> <p>There are no legislation on monitoring and verification requirements for CO<sub>2</sub> storage and injection.</p> <p>However, Section 34A of EQA. states that the Minister may by order prescribe any activity which may have significant environmental impact as prescribed activity.</p> <p>As discussed above, any person intending to carry out any prescribed activity shall appoint a qualified person to conduct an environmental impact assessment and to submit a report thereof to the Director General in the manner as the Director General may prescribe.</p>	The Minister may expressly prescribe the construction of a storage facility for CO <sub>2</sub> as a prescribed activity.

Issue	Area covered	Legal provisions	Competent authority	Timeline	Work needed to resolve issue	Potential legislative amendment/ Comment
3.2 E Fugitive emissions	Operation - Injection	<p>Sections 21, and 24 of the Environmental Quality Act 1974 ("<b>EQA</b>")</p> <p>Environmental Quality (Control of Solid Waste Transfer Stations and Landfill) Regulations 2009, Regulation 6 ("Regulation 2009")</p> <p>Environmental Quality (Clean Air) Regulations 1978, Regulation 49</p>	Department of Environment	Not Applicable	<p>Construction of a storage site is likely to constitute a prescribed activity under the Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 1987.</p> <p><u>Is there any liability for emissions resulting from the injection process?</u></p> <p>There are currently no laws in Malaysia governing liability for emissions of CO<sub>2</sub> resulting from the injection process. However, the existing regime under EQA (as discussed above) and tort law can apply to such a situation.</p> <p>It is provided in the Regulation 2009 that "owner or occupier of a landfill shall design and operate a landfill gas collection and disposal system to minimize the impact resulting from the generation of landfill gas".</p>	
3.2 F Emergency incidents	Operation - Injection				<p><u>What obligations are there to prepare for emergency incidents?</u> <u>Are there any financial bonds or insurance obligations?</u></p> <p>There are no laws on this at the moment with regards storage and injection of CO<sub>2</sub>.</p> <p>The emergency incidents could possibly arise in two circumstances:</p> <p>(a) excessive fugitive emissions causing a hazard to the public; or (b) seepage of the stored CO<sub>2</sub> underground.</p> <p>The Environmental Quality (Clean Air) Regulations 1978 provides that "In the event of damage caused by any violation of the requirements set forth in these Regulations, or of requirements prescribed in accordance with these Regulations, the Director-General may order the violator to take any action necessary to remove, disperse, destroy or mitigate the pollution at the violator's expense. If the violator fails to take satisfactory action within the time prescribed by the Director-General, the Director-General may take such action directly and may recover from violator all costs and expenses incurred in connection therewith."</p>	This could be specified in the licence.

Issue	Area covered	Legal provisions	Competent authority	Timeline	Work needed to resolve issue	Potential legislative amendment/ Comment
3.2 G Occupational Health & Safety (OH&S)	Operation - Injection	Occupational Safety and Health Act 1994 ("OSHA") (Sections 15 and 16)	Department of Occupational Safety and Health ("DOSH"); Ministry of Human Resources		<p>As far as the legislation in Malaysia is concerned, there are no impositions of bonds or insurance obligations that need to be undertaken by the storage site owner.</p> <p><u>What are the OS&amp;H obligations?</u></p> <p>OSHA provides a legislative framework to promote standards for safety and health at work. The legislation defines the general duties of the employer, employees, manufacturers and others.</p> <p>Premises is defined under Section 3 of OSHA to mean, "any installation on land, offshore installation or other installation whether on the bed of or floating on any water..."</p> <p>Plant includes "any machinery, equipment, appliance, implement or tool, any component thereof and anything fitted, connected or appurtenant thereto".</p> <p>Substance means "any natural or artificial substance, whether in solid or liquid form or in the form of a gas or vapour or any combination thereof".</p> <p>Section 21(2) of OSHA states that "it shall be the duty of a person who undertakes the manufacture or supply of any substance for use at work to carry out or arrange for the carrying out of any necessary research with a view to the discovery and, so far as is practicable, the elimination or minimization of any risk to safety or health to which the substance may give rise."</p> <p>Section 30 of OSHA requires the employer to establish a safety and health committee at work if there are more than 40 persons employed on the premises.</p>	<p>For the purposes of CCS legislation, perhaps some analogy may be drawn from <b>Section 12 of Schedule 2 of PMA:</b></p> <p>"(1) The licensee shall maintain all apparatus and appliances and all wells which have not been abandoned and plugged as provided by Clause 10 in good repair and condition and shall execute all operations in or in connection with the exploration area in a proper and workmanlike manner in accordance with the methods and practice of exploration customarily used in good oilfield practice and without prejudice to the generality of the foregoing provision the licensee shall take all steps practicable in order -</p> <p>(a) to prevent the escape or waste of petroleum discovered in the exploration area;</p> <p>(b) to conserve the exploration area for productive operations;</p> <p>(c) to prevent damage to petroleum bearing strata;</p> <p>(d) to prevent the entrance of water through wells to petroleum bearing strata; and</p> <p>(e) to prevent the escape of petroleum into any waters in or in the vicinity of the exploration area.</p> <p>(2) The licensee shall comply with all instructions given by the Petroleum Authority in writing relating to any of the matters set out in paragraph (1). If the licensee objects to any such instruction on the ground that it is unreasonable he may, within fourteen days from the date upon which the instruction was given, refer the matter to arbitration in the manner provided</p>

Issue	Area covered	Legal provisions	Competent authority	Timeline	Work needed to resolve issue	Potential legislative amendment/ Comment
						<p>by Clause 27.</p> <p>(3) The licensee shall give notice to the Petroleum Authority of any event causing escape or waste of petroleum, damage to petroleum bearing strata or entrance of water through wells to petroleum bearing strata within three days of the occurrence of that event."</p>

**TABLE 3.3: STORAGE - DECOMMISSIONING**

Issue	Area covered	Legal provisions	Competent authority	Timeline	Work needed to resolve issue	Potential legislative amendment/ Comment
3.3 A Closure certificate	Decommissioning	<p>Petroleum Mining Act 1966, Schedule 2, Section 10 ("PMA")</p> <p>Mineral Development Act 1994, Section 20 ("MDA")</p>	<p>Department of Environment; Ministry of Natural Resources and Environment ("MNRE"); PETRONAS</p>		<p><i>Is a closure certificate required to close a facility? Does it require special approval? What occurs to storage licence at closure?</i></p> <p>Currently no legislation governing closure.</p> <p>Some analogy may be derived from the PMA. PMA regulates instances where petroleum extraction licensees wish to close their wells or reservoirs. The PMA provides that, "The licensee shall not abandon any well without prior notification in writing to the Petroleum Authority except as provided in paragraphs (5) and (6)."</p> <p>"(6) All the licensee's wells (other than wells to which paragraph (5) applies) in the exploration area shall, unless the Petroleum Authority otherwise determines, be plugged by the licensee not less than one month before the expiry or determination of the licensee's rights under this licence."</p> <p>Besides that, "the licensee shall not commence or, after abandoning in manner hereinafter provided, shall not recommence the drilling of any well without the consent in writing of the Petroleum Authority."</p> <p>Based on the above provisions, it can be said that a CO<sub>2</sub> storage licensee may only abandon or close its storage site upon notifying the licensing authority. Once the storage site has been abandoned or closed, the licensee would need the approval of the licensing authority to recommence the operation of the storage site.</p> <p>"If a condition as is referred to in paragraph (3) relates to the position or depth of the well or its direction or if a condition under any of the foregoing paragraphs relates to any casing, plugging or sealing of the well, the Petroleum Authority may from time to time direct that the well and all records relating thereto shall be examined in such manner upon such occasions or at such intervals and by such persons as may be specified by the Petroleum Authority's direction and the licensee shall pay to any such person or to the Petroleum Authority such fees and expenses for the examination as the Petroleum Authority may specify."</p> <p>Therefore, the licensing authority may specify that records of the storage site or the storage site itself be examined for the purposes of effective plugging, casing or any such actions by the licensee.</p> <p>Section 20 of the MDA has similar provisions to the PMA.                      "(1) Before any mining operations is abandoned or discontinued,</p>	<p>New legislation may be adopted for a closure certificate to be issued, subject to the satisfaction of the relevant authority that all conditions have been met.</p> <p>Australian offshore CCS legislation can be used as a model for such conditions. The certificate serves as a release from responsibility for care of the site, as well as a release of liability. It will incentivise the licence holder to comply with all regulations, licence conditions, and gives an opportunity for the authorities to check that the wells are plugged or closed off, property is removed, and the site is left in a suitable state, before the licence holder is released from responsibility and liability for the site.</p>



Issue	Area covered	Legal provisions	Competent authority	Timeline	Work needed to resolve issue	Potential legislative amendment/ Comment
					<p>a written notice shall be given three months before such intended abandonment or discontinuance by the holder of a proprietary mining licence or mining lease or manager to the Assistant Director and to the Director General of Geological Survey . "</p> <p>"(2) Where any mine is to be abandoned, the holder of the proprietary mining licence or mining lease or manager shall cause to be made an accurate plan, to the satisfaction of the Director, showing the workings of such mine up to the time of abandonment and copies of such plan shall be submitted to the Director and the Director General of Geological Survey within one month after the abandonment."</p> <p>"(3) Where a mine or part of a mine is to be abandoned, the holder of a proprietary mining licence or mining lease or manager shall securely fence or cover every mine shaft and the holder of such licence or lease and the manager shall continue to be personally responsible for the due compliance of this provision until the Director has confirmed in writing that the work has been properly executed, notwithstanding that the mine or part of the mine has been abandoned."</p> <p>There is also the imposition of a performance bond in the mining industry to persuade miners to restore the land on which the mining is carried out.</p>	
3.3 B Liability for stored CO <sub>2</sub>	Decommissioning	Environmental Quality Act 1974 ("EQA") (Sections 22, 24, 25)	Not Applicable		<p><i>Who is liable for stored CO<sub>2</sub>? Can that liability be transferred to another party? Is that liability eventually transferred to the State? How long does the liability continue?</i></p> <p>Currently no legislation governing liability of stored CCS.</p> <p>The EQA imposes restrictions on pollution of the atmosphere, the soil, and inland waters. The EQA specifies that a person shall be deemed to pollute if he places any wastes in or on any place/waters where it may gain access to any soil/waters/or may be released into the atmosphere.</p> <p>The Minister can prescribe acceptable conditions for the emission, discharge or deposit of environmentally hazardous substances. If a person is in breach of the EQA provisions on pollution, he is guilty of an offence and shall be under statutory liability to a fine and/or imprisonment.</p> <p>However, this is subject to the Closure Certificate which may be regulated under law.</p>	<p>The issue of liability or transfer or ownership can be dealt with in the proposed Storage Licence.</p> <p>The Closure Certificate can also impose liability on the storage site operator for a set period of time, which would serve as a warranty and ensure that the licence holder achieves minimum compliance with regulations and closes or plugs off the wells with due skill and care.</p> <p>State Government may be made liable for damages arising from the stored CO<sub>2</sub> after Closure Certificate is issued as the State Government will own the subsurface rights.</p>

Issue	Area covered	Legal provisions	Competent authority	Timeline	Work needed to resolve issue	Potential legislative amendment/ Comment
3.3 C Financial provisions	Decommissioning	Environmental Quality Act 1974 (" <b>EQA</b> ") (Sections 36A, 36B, 36D)	Department of Environment; Ministry of Natural Resources and Environment (" <b>MNRE</b> ")		<p><i>Is there a requirement to provide a bond or upfront financial contribution to cover post-closure obligations? Is there an obligation for long term insurance</i></p> <p>Currently no legislation governing financial contribution for post-closure obligations.</p> <p>The EQA provides that for the purpose of conducting, promoting or co-ordinating research in relation to any aspect of pollution or the prevention thereof, the Minister may make an order for the imposition and collection of a fee on the waste generated.</p> <p>The EQA also specifically provides that the Minister may require any person engaged in the distribution or storage of environmentally hazardous substances, or storage of waste, to contribute to the Environmental Fund at a rate that he may specify.</p>	<p>The power of the Minister to make orders for the imposition of a fee can be extended so that the Minister may order collection of a fee upon closure. The money will be deposited into the statutory Environmental Fund.</p> <p>The Environmental Fund can be used as a model, and CCS-related contributions could also become part of the fund, or a new fund can be created on a statutory basis.</p>
3.3 D Obligations in the event of insolvency	Decommissioning	Environmental Quality Act 1974 (" <b>EQA</b> ") (Section 14)	Department of Environment; Ministry of Natural Resources and Environment (" <b>MNRE</b> ")	Not Applicable	<p><i>If the injection operator becomes insolvent, who acquires on-going monitoring and/or closure responsibility?</i></p> <p>Currently no legislation governing on-going monitoring and closure responsibility.</p> <p>Under section 14 of the EQA where the holder of a licence ceases to be the occupier of the premises specified in the licence, the current occupier may apply to the Director General for approval of the transfer to him of the licence in respect of those premises.</p>	
3.3 E On going monitoring obligations	Decommissioning	Not Applicable	Not Applicable	Not Applicable	<p><i>Are there on going monitoring obligations? Who is responsible for carrying it out? Who is financially responsible?</i></p> <p>Currently no legislation governing on-going monitoring and closure responsibility.</p>	

**TABLE 3.4: STORAGE - POST-DECOMMISSIONING**

<b>Issue</b>	<b>Area covered</b>	<b>Legal provisions</b>	<b>Competent authority</b>	<b>Timeline</b>	<b>Work needed to resolve issue</b>	<b>Potential legislative amendment/ Comment</b>
					Currently no legislation governing post-commissioning of storage sites.	

## APPENDIX II - Workshop agenda



GLOBAL  
CCS  
INSTITUTE



**KeTTHA**  
KEMENTERIAN TENAGA,  
TEKNOLOGI HIJAU DAN AIR

**CCS Legal and Regulatory Framework Workshop**

**27 February – 1 March 2013**

**Location:** Lumut, Perak, Best Western Hotel, Pangkor, Marina Island, Lumut

**Chair:** Mr Anbalagan K, KeTTHA

**Facilitator:** Dr Craig Hart (CH), Renmin University of China

**Breakout Session Facilitators:**

- Ms Alice Gibson (AG) Global CCS Institute
- Mr Ian Havercroft (IH) Global CCS Institute
- Dr Craig Hart (CH), Renmin University of China
- Paul Curnow (PC) Baker & McKenzie

**Day 1: Wednesday 27 February**

Time	Item	Parties/Speakers
09.00 – 12.00	<b>Participants Arrive</b> <ul style="list-style-type: none"> <li>• Participants arrive and register at Best Western Hotel, Lumut</li> </ul>	All
	<b>Own Lunch (TBC)</b>	All
14.00 – 14.45	<b>Depart for Site Visit</b> <ul style="list-style-type: none"> <li>• For participants already in hotel, assemble at hotel lobby for the KeTTHA vehicle to lead the way to TNB's Janamanjung Power Plant</li> <li>• Alternatively, participants can assemble outside of Janamanjung Power Plant</li> </ul>	All
15.00 – 17.00	<b>Site Visit</b> <ul style="list-style-type: none"> <li>• Site visit of TNB's Janamanjung Power Plant</li> </ul>	All
17.00	<b>Depart for Hotel</b>	All
19.00–20.30	<b>Dinner</b>	All

**Day 2: Thursday 28 February**

Time	Item	Parties/Speakers
8.15 – 8.45	Registration	All
8.45 – 9.00 (15mins)	<b>Welcome</b> <ul style="list-style-type: none"> <li>Chair welcomes and introduces participants</li> </ul>	Chair
9.00 – 9.10 (10mins)	<b>Aims and format of workshop</b>	Facilitator
9.10 – 9.35 (20mins)	<b>What is CCS?</b> <ul style="list-style-type: none"> <li>A brief explanation of CCS and global status of CCS</li> </ul>	AG
9.35 – 9.50 (15mins)	<b>Overview of Global CCS Laws and Regulation:</b> <ul style="list-style-type: none"> <li>Brief introduction to other CCS regulatory frameworks (e.g. from EU, USA, Australia) that will provided the basis for further discussion of specific details throughout the workshop</li> </ul>	IH
10.10 – 11.10 (60mins)	<b>Summary of Permitting Matrix &amp; Overview of Existing Regulatory Framework</b> <ul style="list-style-type: none"> <li>Wong and Partners will give an overview of the permits, approvals, certificates etc that may currently apply to a CCS project</li> <li>Panel Discussion with Malaysian stakeholders</li> <li>Master Facilitator will ask specific questions of panel representatives to draw out relevant aspects of Malaysia's existing legal and regulatory framework</li> <li>Question and answer</li> </ul>	Panel Facilitator: CH Representatives from: Attorney-General's Chambers KeTTHA, Energy Commission KeTTHA UNITEN Wong & Partners
11.10–11.30 (20mins)	<b>Coffee Break</b>	
	<b>Session 1 – Capture</b>	
11.30– 11.40 (10mins)	<b>Session Introduction</b> <ul style="list-style-type: none"> <li>Brief explanation of session format</li> </ul>	Facilitator
11.40 – 12.00 (10 mins for each presentation)	<b>Introductory Presentations</b> <ul style="list-style-type: none"> <li>Tenaga Nasional Berhad (TNB) – will present on the process they undertake when seeking the necessary permits and approvals for a power project</li> <li>CCS Legal/Regulatory Expert – will present on key legal/regulatory issues pertaining to capture and how other countries have addressed these</li> </ul>	TNB representative  PC
12.00 – 13.00 30min discussion 30mins feedback	<b>Break out session</b> <ul style="list-style-type: none"> <li>Participants break up into groups to identify gaps, overlaps and areas of improvement, drawing on participants' expertise</li> <li>Group feedback captured on feedback forms</li> <li>Group spokesperson to relay back to the wider group top overlap, gap and area for improvement</li> <li>Feedback forms collected</li> </ul>	Group Facilitators: AG, CH, IH, PC

13.00 – 13.10 (10mins)	Sum up key issues	Facilitator
13.10 – 14.40 (1.5 hours)	Lunch	
	Session 2 – Transport	
14.40 – 14.45 (5mins)	Session Introduction	Facilitator
14.45 – 15.05	<b>Introductory Presentations</b> <ul style="list-style-type: none"> <li>CCS Legal/Regulatory Expert – will present on key legal/regulatory issues pertaining to transport and how other countries have addressed these</li> </ul>	AG
15.05 – 16.05 (60mins)	<b>Break out session</b> <ul style="list-style-type: none"> <li>Same format as capture session</li> </ul>	Group Facilitators AG, CH, IH, PC
16.05 – 16.15 (10mins)	Sum up key issues	Facilitator
16.15–16.30	<b>Follow-up Discussion – if needed</b> <ul style="list-style-type: none"> <li>Time to follow up any issues in more depth</li> </ul>	
16.30	Day Close	
19.00 – 20.30	Dinner	

**Day 3: Friday 1 March**

Time	Item	Parties/Speakers
	<b>Session 3 – Storage</b>	
9.00 – 9.10 (10mins)	<b>Session Introduction</b> <ul style="list-style-type: none"> <li>Brief recap from yesterday</li> <li>Brief introduction to storage session</li> </ul>	Facilitator
9.10 – 9.30 (20mins)	<b>Introductory Presentation</b> <ul style="list-style-type: none"> <li>CCS Legal/Regulatory Expert – will present on key legal/regulatory issues pertaining to storage and how other countries have addressed these</li> </ul>	IH
9.30 – 10.30 (60 mins)	<b>Break out session</b> <ul style="list-style-type: none"> <li>Same format as capture session</li> </ul>	Group Facilitators AG, CH, IH
10.30 – 10.40 (10mins)	<b>Sum up key issues</b>	Facilitator
10.40–11.00 (20mins)	<b>Coffee Break</b>	
	<b>Session 4 – Cross-cutting Issues</b>	
11.00 – 11.20	<b>Introductory Presentations</b> <ul style="list-style-type: none"> <li>CCS Legal/Regulatory Expert – will present on key legal/regulatory issues pertaining to cross-cutting issues and how other countries have addressed these</li> </ul>	CH
11.20 – 12.05 20 mins panel discussion 25 mins Q&A	<b>Panel Session</b> <ul style="list-style-type: none"> <li>Panel session regarding cross-cutting issues</li> <li>Questions and answer session</li> </ul>	Representatives from: KeTTHA Global CCS Institute UNITEN
12.05 – 12.10 (5mins)	<b>Sum up key issues</b>	Facilitator
12.10 – 12.20 (15 mins)	<b>Workshop Summary</b> <ul style="list-style-type: none"> <li>Summary of workshop's key issues</li> <li>Outline of next steps, final report and opportunity to provide further feedback</li> </ul>	Facilitator AG
12.20 – 12.30 (10 mins)	<b>Workshop Close</b> <ul style="list-style-type: none"> <li>Chair to thank participants and formally close workshop</li> </ul>	Chair
12.30	<b>Close</b>	



### APPENDIX III - Group feedback form



<p>REGULATORY COMPONENT (please tick)</p> <p>Capture <input type="checkbox"/></p> <p>Transport <input type="checkbox"/></p> <p>Storage <input type="checkbox"/></p> <p>Cross-cutting issue <input type="checkbox"/></p>	<p>GROUP NAME OR NUMBER</p> <p>(Group members to be recorded separately)</p>
<p>AUTHORITIES INVOLVED (please tick)</p> <p>EPU <input type="checkbox"/>      PETRONAS <input type="checkbox"/></p> <p>MNRE <input type="checkbox"/>      TNB <input type="checkbox"/></p> <p>KeTTHA <input type="checkbox"/>      KNB <input type="checkbox"/></p> <p>EC <input type="checkbox"/>      SIRIM Berhad <input type="checkbox"/></p> <p>MOSTI <input type="checkbox"/>      MITI <input type="checkbox"/></p> <p>MDTCA <input type="checkbox"/>      OH&amp;S <input type="checkbox"/></p> <p>Standards Malaysia <input type="checkbox"/></p> <p>Other <input type="checkbox"/> _____</p> <p>LEAD AUTHORITY: _____</p>	<p>OTHER INTERESTED GROUPS</p> <p>NGOS <input type="checkbox"/></p> <p>Local community <input type="checkbox"/></p> <p>_____ <input type="checkbox"/></p> <p>_____ <input type="checkbox"/></p>

KEY ISSUES AND/OR COMMENTS

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TOP THREE GAPS

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TOP THREE OVERLAPS

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TOP THREE AREAS OF IMPROVEMENT OR OPPORTUNITIES TO STREAMLINE

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