Understanding China’s Emissions Trading Schemes and Emissions Reporting

A guide to China’s pilot emissions trading scheme and monitoring, reporting and verification requirements
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Part 1: China's pilot emissions trading schemes – understanding emissions trading
China’s emissions reduction policies

Following the release of China’s 12th Five Year Plan (2011-2015) in 2011, which includes a 2020 emissions intensity reduction target, the national Development and Reform Commission (DRC) has been taking steps to regulate and reduce greenhouse gas emissions and energy use.

Specifically, the national DRC has selected seven regions to implement pilot emissions trading schemes (collectively referred to as ‘the pilot schemes’) over the period 2013 to 2015, and in late 2013 released its first accounting methods for greenhouse gas emissions for ten sectors of the economy (including steel, chemical, glass, cement and ceramics manufacturing, aluminum and magnesium smelting, power generation, power grids, and civil aviation). The 13th Five Year Plan (due to be released in 2016) is expected to include even further measures to reduce national emissions and energy usage including the possibility of a national emissions trading scheme (ETS).

With the introduction of the pilot schemes, coupled with the central Government’s focus on energy security and energy efficiency, now is the time for Chinese enterprises to understand the processes that are required to operate under an ETS - in particular, those related to internal carbon monitoring, reporting and verification (MRV).

Preparing for a pilot scheme or introducing MRV processes voluntarily will assist enterprises in adapting to a more energy constrained environment and assist in meeting tighter national and international standards on emissions reporting. This paper aims to guide enterprises in understanding the implications of operating under an ETS.

Specifically this paper:
- Discusses the key concepts of the MRV processes and the issues enterprises may experience while adjusting to a carbon accounting environment
- Explains the different designs of the pilot schemes and the ramifications of the different design features for enterprises
- Highlights the MRV areas of the pilot schemes where information is not yet known and explains the options available in these cases

This information is also relevant for those enterprises not covered by the pilot schemes but looking to improve their emissions reporting in the likelihood of a national ETS.

What do the pilot schemes mean for China’s emission abatement efforts?

China’s emissions target provides an indication of emissions trajectory

The 12th Five Year Plan sets a target to reduce emissions per unit of gross domestic product (GDP) to between 40% and 45% by 2020, based on 2005 emissions. Diagram 1 shows the abatement required by 2020 to meet this goal against the business-as-usual scenario. The total abatement (the cumulative area between the two trajectories) from the start of 2011 (being the year the 12th Five Year Plan was issued) to the target date of 2020 is estimated to be 33 giga tonnes of carbon dioxide equivalent (Gt CO2-e). To put this into perspective, this abatement is five times the annual emissions of the USA. To achieve such a target will require significant reductions in the emissions intensities across all sectors of the economy, and in particular high emitting industrial sectors (such as coal fired power generation), mining, manufacturing industries (such as steel and cement) and transport.

Diagram 1: Indicative trajectory and 2020 target range

1 Emissions intensity continues at 2010 level including land use change and forestry and GDP growth is steady at 9% p.a
2 EY analysis
3 Based on 2011 EPA official statistics
What does it mean for enterprises covered by the pilot schemes?

The pilot schemes will be one measure used to meet the national emissions reduction target but care is being taken to design the schemes on a provincial basis. Each region or city covered under a pilot scheme has a different economic growth outlook and greenhouse gas emissions profile. This means each pilot scheme has different design characteristics and a different abatement target aimed to suit the province's profile.

For example, Shanghai, Beijing and Shenzhen are commercial cities located on the more developed Eastern coast, with a higher GDP per capita and lower GDP growth rates compared to the central and western regions. For this reason these pilot schemes' coverage includes large commercial and public buildings and Shanghai's pilot scheme includes the transport sector. Emissions offset credits (discussed in more detail in the next section) are allowed to be sourced (to some degree) from other provinces, as abating emissions tends to be cheaper in less developed areas. These three schemes were also the first three to become operational.

Conversely, the Hubei and Chongqing pilot schemes are located in the faster growing central China region. The Central Provinces have a higher GDP growth rate than the East Coast and are less commercialised. The pilot schemes in these two provinces are expected to cover only heavy industrial sectors, excluding commercial buildings and transport. These schemes only allow the use of emissions offset credits that originate from their own province as emissions abatement is expected to be cheaper and more readily available from these provinces. Both pilot schemes are expected to commence trading in 2014 and are the last two to become operational.

The different pilot schemes' designs aim to achieve the province's emissions intensity reduction target without adversely affecting economic growth projections. However, regardless of the design it is the enterprises covered under each of the pilot schemes that will play the most significant role in meeting these targets.

How an ETS operates

In considering ETS design there are two key variables: a set level of allowable emissions and price. An ETS sets a 'cap' on the total allowable emissions with the market then determining the price based on supply and demand. Most ETSs have designated exchanges where buyers and sellers of emissions credits can place in bids and offers at a price and quantity they wish to deal at which can then be matched based on price. The trading of emissions allowances puts a financial cost on emitting excess greenhouse gases and gives a financial incentive to reduce emissions and sell excess quota volumes.

However, unlike other markets, ETSs are usually complimented with an emissions offset scheme. Offset schemes allow emission abatement activities to generate emission offset credits for each tonne of CO₂ abated. These credits add to the ETS supply and can be purchased by an enterprise producing emissions to offset their emissions. Under the pilot schemes these offset credits are known as China Certified Emissions Reductions (CCERs).

An ETS coupled with an emissions offset scheme is theoretically the least-cost approach to reducing greenhouse gas emissions.

The basic steps of participating in an ETS are as outlined in Diagram 3.
### Diagram 3: Overview of an ETS

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Coverage of a pilot scheme determined</td>
<td>A pilot scheme will cover certain sectors of the economy, certain types of greenhouse gas emissions and certain enterprises that emit covered emissions above a threshold level set by the local DRC. Enterprises will need to assess if they meet the requirements of the scheme and are therefore required to report and trade.</td>
</tr>
<tr>
<td>2 Emissions allowances allocated to enterprises</td>
<td>The Government will set an annual cap on total greenhouse gas emissions from covered enterprises, each enterprise operating under a pilot scheme receives an emissions allowance or quota which allows them to emit a certain volume of this total cap.</td>
</tr>
<tr>
<td>3 Measurement of covered emissions</td>
<td>During the compliance period the enterprise monitors the emissions they release during the year.</td>
</tr>
</tbody>
</table>
| 4 Trading of emissions allowances | If actual emissions of the enterprise are different to the quota volume the enterprise can sell or buy the difference through the regional emissions trading exchange:  
  - If actual emissions are over the quota then the enterprise will need to purchase the difference at the market price  
  - If actual emissions are below the quota then the enterprise can sell the difference at the market price |
| 5 Reporting of emissions during compliance period | Enterprises are required to submit an annual report of the emissions total of the enterprise during the compliance period (known as an emissions inventory). This is received by the Government body regulating the ETS which can require the inventory to be verified by an independent third party. |
| 6 Surrendering of emissions allowances | The enterprise will then be required to surrender an emissions quota equal to the emissions total in the report. |

The timing of each of the steps detailed above can vary between the pilot schemes. However, the general order of each step will be similar with:

- Emissions allocation at the start or during the annual compliance period,
- Monitoring and trading conducted throughout the compliance period and
- Reporting and Surrender occurring at the end of the annual compliance period.

The compliance timetable for the Shanghai and Beijing pilot schemes, is illustrated in Diagram 4. Enterprises in other pilot schemes can use this information to better understand the flow of compliance milestones that they will be subject to.

The compliance timetable and MRV requirements of an ETS are outlined in guidance documents issued by the provincial DRCs. Enterprises need to adhere to these guidance documents in order to be compliant. Not all pilot schemes have released their final guidance as yet and for this reason Part 2 of this report covers expected compliance requirements.
### Diagram 4: Example compliance timetable (Shanghai / Beijing pilot scheme)

<table>
<thead>
<tr>
<th>Step</th>
<th>Shanghai timetable</th>
<th>Beijing timetable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Coverage of a pilot scheme determined</td>
<td>Completed in 2013 for existing operatives. No information on the timing of the assessment of new entrants.</td>
<td>Completed in 2013 for existing operatives. New entrants to be assessed between March and May of next compliance year.</td>
</tr>
<tr>
<td>2 Emissions allowances allocated to enterprises</td>
<td>Once off allocation for the 2013-2015 period has been completed in 2013.</td>
<td>Annual allocation occurring between June and November of that compliance year.</td>
</tr>
<tr>
<td>3 Measuring of covered emissions</td>
<td>Compliance period runs from 1 January to 31 December. Measurement required during this period.</td>
<td>Compliance period runs from 1 January to 31 December. Measurement required during this period.</td>
</tr>
<tr>
<td>4 Trading of emissions allowances</td>
<td>Trading for each compliance period can occur at any time until surrender date which is in June of the following year.</td>
<td>Trading for each compliance period can occur at any time until surrender date which is in June of the following year.</td>
</tr>
<tr>
<td>5 Reporting of emissions during compliance period</td>
<td>Report due between 1 - 31 March of the following compliance year. Third party verification conducted by 15 April.</td>
<td>Report and third party verification due between March and May of the following compliance year.</td>
</tr>
<tr>
<td>6 Surrendering of emissions allowances</td>
<td>Surrender of permits for each compliance period due between 1 - 30 June of the following year.</td>
<td>Surrender of permits for each compliance period due in June of the following year.</td>
</tr>
</tbody>
</table>
There are several variables that need to be assessed in determining if an enterprise is covered by a pilot scheme including sector of operation, types of activities undertaken and types of greenhouse gases emitted. Each pilot scheme has set different boundaries on these variables.

The key questions that need to be asked are:
1. What is the location and industrial sector of operation?
2. What are the ‘reporting boundaries’ required by the pilot scheme?
3. What are the ‘covered emissions’ compared to the pilot scheme’s threshold levels?

Diagram 5 shows how the answers to these questions will determine whether you are covered under a pilot scheme or not (steps two and three are explained in further detail on page 11 and on page 14).

Diagram 5: Decision tree to determine if you are covered

Start

1. Identified by NDRC or regional DRC as liable
   - Yes: Covered by pilot scheme
   - No: Refer to Section: Reporting boundaries on page 11

2. Do you operate a facility located in a pilot scheme province?
   - No: Not covered by pilot scheme
   - Yes: Refer to Section: Covered emissions on page 14

3. Are the facility’s covered emissions over the pilot scheme’s threshold?
   - No: Not covered by pilot scheme
   - Yes: Covered by pilot scheme
Summary of key design elements of the pilot schemes

The pilot schemes have been designed and regulated on a provincial or city basis by the local DRC bodies. Of the seven pilot schemes, five are currently operational and the remaining two pilot schemes are due to commence in 2014. Each design element listed in the table below can have a varied effect on a covered enterprise depending on the circumstances. For instance the method used for quota allocation may cause a particular enterprise to either have an undersupply of emission permits, requiring them to purchase a balance or an oversupply of emission permits meaning they can sell their excess balance. Therefore the design of the quota allocation method can have significantly different financial impacts on an enterprise.

The impacts resulting from different pilot scheme designs are discussed further in the MVR section of this report. For some pilot schemes little official information has been released relating to the detailed design of the pilot scheme. In these cases the different options for design are discussed so enterprises can understand the potential implications.

Table 1: Key design elements for Shenzhen, Shanghai, Beijing and Guangdong pilot schemes

<table>
<thead>
<tr>
<th>Design element</th>
<th>Shenzhen</th>
<th>Shanghai</th>
<th>Beijing</th>
<th>Guangdong</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start date</td>
<td>18 June 2013</td>
<td>26 November 2013</td>
<td>28 November 2013</td>
<td>19 December 2013</td>
</tr>
<tr>
<td>Approximate price guide</td>
<td>60 Yuan</td>
<td>25 Yuan</td>
<td>50 Yuan</td>
<td>60 Yuan</td>
</tr>
<tr>
<td>Emission intensity</td>
<td>21% reduction by 2015 based on 2010 levels</td>
<td>19% reduction by 2015 based on 2010 levels</td>
<td>18% reduction by 2015 based on 2010 levels</td>
<td>19.5% reduction by 2015 based on 2010 levels</td>
</tr>
<tr>
<td>Coverage</td>
<td>Annual threshold for liability of 5,000 t CO₂</td>
<td>Annual threshold for liability is 20,000 t CO₂ if you operate in the steel manufacturing, petrochemicals and electricity generation sectors</td>
<td>Annual threshold for liability is 10,000 t CO₂ or energy consumption of greater than 5,000 TCE (tonnes of coal equivalent) between 2009 and 2012</td>
<td>Covers four sectors: power, cement, iron and steel and petrochemical</td>
</tr>
<tr>
<td>Reporting level</td>
<td>Legal person</td>
<td>Legal entity</td>
<td>Legal entity</td>
<td>Unknown</td>
</tr>
<tr>
<td>Point of obligation</td>
<td>Scope 1 emissions reported at point of release</td>
<td>Scope 1 emissions reported at point of release</td>
<td>Scope 1 emissions reported at point of release but excludes mobile combustion</td>
<td>Scope 1 emissions reported at point of release</td>
</tr>
<tr>
<td>Offsets</td>
<td>Use of Chinese Certified Emissions Reductions (CCERs) limited according to supply volumes and qualitative standards</td>
<td>Use of CCERs limited to 5%, which may change over time depending on the economic circumstances</td>
<td>CCERs limited to 5% of annual covered emissions, with preference for Beijing based projects</td>
<td>CCERs limited to 10% of annual covered emissions, with 70% required to be Guangdong based projects</td>
</tr>
<tr>
<td>Design element</td>
<td>Shenzhen</td>
<td>Shanghai</td>
<td>Beijing</td>
<td>Guangdong</td>
</tr>
<tr>
<td>----------------</td>
<td>----------</td>
<td>----------</td>
<td>---------</td>
<td>-----------</td>
</tr>
</tbody>
</table>
| Quota allocation | • Online platform based on estimates for 2013 to 2015 production volumes  
• Quotas can be revised once actual production is reported  
• 2% of the total quota is to be set aside for new entrants | • Quotas allocated based on an enterprise’s historical emissions between 2009 and 2011 with consideration of enterprise’s expected future development  
• Quotas will be allocated on a one-off basis for the period 2013-2015  
• Quotas will be known as SHEA (Shanghai Emission allowances) | • Quotas will be allocated based on the emissions profile of each sector and the historical emissions of each enterprise between 2009 and 2012  
• For new entrants quotas will be set from an emissions intensity benchmark for each industry  
• Quotas will be allocated twice annually, initial allocation for existing firms and a second allocation for new entrants  
• 98% will be freely allocated in 2013, dropping to 94% by 2015, with a remaining balance available for sale | • Quotas will be allocated on a one-time basis for the 2013 to 2015 period  
• This allocation process will be based on historical emissions between 2010 and 2012 and the emission intensity and economic structure of the sector the enterprise operates in  
• New entrants quotas will be assigned for expansion over 10,000 t CO₂  
• 97% of quotas will be freely allocated with 3% auctioned in 2013 and 2014, falling to 90% in 2015 |
| Reporting guidance | • Shenzhen Market Supervision Administration has released guidance: “Specification with guidance for quantification and reporting of the organization’s greenhouse gas emissions”  
• Guidance references international GHG standards ISO 140064 and GHG Protocol  
• Guidance refers to reporting on six greenhouse gases:  
  • Carbon dioxide (CO₂)  
  • Methane (CH₄)  
  • Nitrous oxide (N₂O), Hydrofluorocarbons (HFCs)  
  • Perfluorocarbons (PFCs)  
  • Sulfur hexafluoride (SF₆)  
• Note: only CO₂ emissions are liable | • Guidance released: “Technical standard for GHG accounting and reporting of Shanghai (interim)”  
• Guidance references international GHG standards “IPCC guidelines for national greenhouse gas inventories”  
• There are also specific guidance for the following sectors:  
  • Textile, paper & pulp  
  • Non-metal mining production  
  • Steel and iron  
  • Aviation  
  • Commercial buildings  
  • Shopping mall and real estate  
  • Non-ferrous metal  
  • Transport- port, airports and train stations | • Beijing DRC has released sector specific guidance for the MRV requirements for the following sectors:  
  • Power generation  
  • Heat generation  
  • Cement manufacturing  
  • Petrochemical manufacturing  
  • Other industrial sectors  
  • Service sector | • Guangdong Provincial Government released: “Temporary regulation on carbon emission management in Guangdong province” which came into effect 1 March 2014 |
| Penalties | • Shenzhen’s DRC’s guidance specified penalties of three times the market price of carbon for any shortfall in surrendered quotas  
• Monetary penalties ranging from CNY10,000 to CNY100,000  
• Shanghai DRC has also indicated it could make it difficult for non-compliant enterprises to obtain government approval to expand capacity or the enterprise may become ineligible for certain preferential policies and government subsidies | • Monetary penalties ranging from CNY10,000 to CNY100,000  
• Shanghai DRC has also indicated it could make it difficult for non-compliant enterprises to obtain government approval to expand capacity or the enterprise may become ineligible for certain preferential policies and government subsidies | • Beijing DRC will regulate the scheme and are expected to release penalties in the range of two to three times the carbon price once penalties are finalised and approved | • Guangdong Provincial Government temporary guidance specified penalties for shortfall in surrendered quotas of double the market price and a CNY50,000 fine and CNY10,000-50,000 fine for falsifying information or hindering verification processes |
| Trading infrastructure | • China Shenzhen Emissions Exchange  
• Shenzhen Market Supervision Administration | • Shanghai Environment and Energy Exchange  
• Shanghai DRC has also indicated it could make it difficult for non-compliant enterprises to obtain government approval to expand capacity or the enterprise may become ineligible for certain preferential policies and government subsidies | • Beijing Environment Exchange  
• Beijing DRC will regulate the scheme and are expected to release penalties in the range of two to three times the carbon price once penalties are finalised and approved | • China Emission Exchange |
Table 2: Key design elements for Tianjin, Hubei and Chongqing pilot schemes

<table>
<thead>
<tr>
<th>Design element</th>
<th>Tianjin</th>
<th>Hubei</th>
<th>Chongqing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start date</td>
<td>26 December 2013</td>
<td>Expected March 2014</td>
<td>2014</td>
</tr>
<tr>
<td>Emission intensity target based on GDP</td>
<td>19% reduction by 2015 based on 2010 levels</td>
<td>17% reduction by 2015 based on 2010 levels</td>
<td>18% reduction by 2015 based on 2010 levels</td>
</tr>
<tr>
<td></td>
<td>An annual absolute cap will be set with flexibility to adjust between compliance periods for changes in supply and demand</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coverage</td>
<td>Annual threshold for liability is 20,000 t CO₂ in any year from 2009 onwards</td>
<td>Annual threshold for liability is 60,000 TCE in any year from 2009 to 2011</td>
<td>Annual threshold for liability is 20,000 t CO₂</td>
</tr>
<tr>
<td></td>
<td>Liability threshold includes scope 1 and scope 2 CO₂ emissions</td>
<td>Enterprises with 8,000 TCE are required to report and will be liable in the future</td>
<td>Liability threshold includes scope 1 and scope 2 CO₂ emissions</td>
</tr>
<tr>
<td></td>
<td>Covers approximately 130 enterprises</td>
<td>Liability threshold includes scope 1 and scope 2 CO₂ emissions</td>
<td>COOKIE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Covers approximately 130 enterprises</td>
<td></td>
</tr>
<tr>
<td>Reporting level</td>
<td>Unknown</td>
<td>Legal entity</td>
<td>Unknown</td>
</tr>
<tr>
<td>Point of obligation</td>
<td>Scope 1 emissions reported at point of release</td>
<td>Scope 1 emissions reported at point of release</td>
<td>Scope 1 emissions reported at point of release</td>
</tr>
<tr>
<td></td>
<td>Scope 2 emissions from electricity and heat reported by end user</td>
<td>Scope 2 emissions from electricity and heat reported by end user</td>
<td>Scope 2 emissions from electricity and heat reported by end user</td>
</tr>
<tr>
<td>Offsets</td>
<td>CCERS limited to 10% of the annual liability</td>
<td>CCERs limited to 15% of annual liability with new entrants to the scheme being restricted to a 10% cap on CCER usage</td>
<td>Expected that CCERs will be allowed for 5-10% of annual liability, similar to other schemes</td>
</tr>
<tr>
<td></td>
<td>CCERS must originate from the province and from enterprises that are outside the scope of the pilot scheme</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quota allocation</td>
<td>Quotas allocated on historical emissions data for existing enterprises and on a sectoral benchmark for new entrants</td>
<td>Quota allowances will be issued by the end of May for each compliance year</td>
<td>No information obtained on calculation methodology as yet</td>
</tr>
<tr>
<td></td>
<td>Freely allocated quotas will be based on historical sectoral emissions data</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3% of quotas will be auctioned</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A proportion of cap will be reserved for new entrants</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reporting guidance</td>
<td>No further information as yet</td>
<td>Enterprises with over 8,000 TCE are required to report but reporting guidance yet to be finalised</td>
<td>No further information as yet</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sector methodologies will be based on IPCC 2006 guidelines</td>
<td></td>
</tr>
<tr>
<td>Penalties</td>
<td>No further information as yet</td>
<td>A penalty of three times the market price applies for emissions not covered by the enterprises surrendered permits</td>
<td>No further information as yet</td>
</tr>
<tr>
<td>Trading infrastructure</td>
<td>Tianjin Climate Exchange</td>
<td>Wuhan Optics Valley United Property Rights Exchange</td>
<td>Chongqing United Assets and Equity Exchange</td>
</tr>
</tbody>
</table>
Part 2: A summary guide to monitoring, reporting and verification- helping you comply
Overview of MVR processes

Some provincial DRCs are yet to release their final guidance on the MRV requirements for enterprises covered by their pilot scheme (even though most pilot schemes are in operation or are expected to be operating shortly). Furthermore, the official guidance documentation that has been released, in some instances, has limited information on important aspects of emissions reporting. For this reason we have compiled an MVR guide to assist enterprises in understanding the ‘grey’ areas and assessing the impacts of different reporting methods if no set approach is given in guidance documents. A summary of this guide is provided in this section.

The guide can also be used for enterprises considering voluntarily monitoring and reporting their greenhouse gas emissions for the first time in anticipation of a national ETS and tighter international reporting standards and scrutiny.

These concepts can be complex and given the range of different sectors covered under the pilot schemes, difficult to apply. We explore each concept further in this section.

<table>
<thead>
<tr>
<th>To ensure compliance with the pilot scheme requirements there are concepts specific to emissions reporting that need to be understood and applied appropriately during the MRV processes, such as:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Point of obligation</strong></td>
</tr>
<tr>
<td><strong>Reporting boundaries</strong></td>
</tr>
<tr>
<td><strong>Covered emissions</strong></td>
</tr>
<tr>
<td><strong>Allocation of quotas</strong></td>
</tr>
<tr>
<td><strong>Compliance requirements</strong></td>
</tr>
<tr>
<td><strong>Record keeping</strong></td>
</tr>
</tbody>
</table>

Point of obligation

Point of obligation refers to where in an emission life cycle the requirement to report and pay for that emission exists. Usually an ETS design selects the point of obligation from one of the following options:

| Upstream | Liability occurs before the greenhouse gas has been emitted e.g. a coal mining company being liable for the emissions in the coal it produces before the coal is sold and burnt. |
| At the point of emission | Liability occurs at the point the greenhouse gas is emitted e.g. a coal fired power station is liable for its combustion of coal to generate electricity. |

Reporting boundaries

Determining at what level an enterprise is required to submit an emissions report and what its total liability is can be complex, particularly for large diversified organisations.

To assist enterprises in understanding what parts of their business will be impacted, the first questions to consider are:

1. What level of your business will be required to submit an emissions report?
2. What level of your business will the pilot scheme’s liability threshold apply?
3. Where do the boundaries of ownership for emissions at your business’ facilities lie?
4. Will you be responsible for only your emissions or also for certain contractors and joint ventures?

In this section these questions are answered where known and the different options are compared for those pilot schemes awaiting final guidance from the provincial DRC and for those enterprises constructing voluntary emissions reports.

The first two questions have different answers depending on the regulations of each pilot scheme. The level of the business required to report (the reporting unit) and the level of the business that the liability threshold is applied at, can either be the:

- Enterprise level
- Entity level
- Facility level

In the simplest case the reporting unit and the liability threshold will occur at the same level, for example under the Beijing pilot scheme where it has been confirmed the entity level is the reporting unit and is the level the liability threshold is applied. This is consistent with the current energy reporting
Once the reporting unit is identified and the application of the liability threshold is applied at the appropriate level of the business, the next step is to understand where the boundaries for emissions reporting at each facility end. This concept is commonly known as facility boundaries. A clear definition of facility boundaries for the purpose of emissions reporting is not yet clearly identified for all pilot schemes.

For this reason the common principals used to determine facility boundaries are discussed below so enterprises can understand the implications of different facility boundary setting on their emissions liability.

There are structural situations where facility boundaries are not so easily defined by the principals of operational control and geographical location. Three common examples of this are:

- The geographical location of transport sector facilities
- The operational control for enterprises operating in a joint venture
- The operational control for shared facilities or equipment such as utilities

The special cases of reporting boundaries for the transport sector and joint ventures are explained in more detail on page 13 to assist enterprises understand these grey areas.

Common principals for determining facility boundaries:

- **Operational control**: The person/enterprise with the authority to implement operational and health, safety and environment policies over a facility is deemed as having operational control and is responsible for monitoring and reporting the emissions from that facility. This can include activities performed by contractors working under an enterprise’s operational control at the facility.

- **Geographical location of emissions**: Emissions from activities performed in the geographical location of the facility are required to be reported if the owner has operational control of the activity. Again this can include contractors and leased equipment that is being utilised on site.

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**Diagram 6: Implications of different liability threshold approaches**

<table>
<thead>
<tr>
<th>Enterprise Threshold Approach:</th>
<th>Entity Threshold Approach:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liability threshold applied here</td>
<td>Scope of liability: All covered emissions at facilities located in that province are included in the emissions report. In this example, for the Enterprise: Liability = Facility 2 + Facility 3 + Facility 4</td>
</tr>
<tr>
<td></td>
<td>Entity 1: Liability = Facility 2 + Facility 3</td>
</tr>
<tr>
<td></td>
<td>Entity 2: not required to report as not in province</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Facility Threshold Approach:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liability threshold applied here</td>
</tr>
<tr>
<td>Scope of liability: Only covered emissions at that facilities if located in that province are included in the emission report. In this example, for Facility 3: Liability = Facility 3</td>
</tr>
<tr>
<td>Facilities 2 and 4 are below the liability threshold</td>
</tr>
<tr>
<td>Facilities 1 and 5 not required to report as not in province</td>
</tr>
</tbody>
</table>

Geographical location is in province with a pilot scheme

---

requirements, so streamlines the reporting and administration burden on covered enterprises.

However in some cases the reporting unit and the level the liability threshold applies are different. For instance, under the Shenzhen scheme thresholds apply to building sizes, which is a facility level threshold and the reporting unit is the ‘legal owner’ of that facility, whether that be the entity or the enterprise.

Many pilot schemes are yet to finalise the details of the reporting unit and the level of the business the liability threshold applies. Identifying the correct reporting unit as either the enterprise or entity is generally straight forward once final reporting guidelines for all pilot schemes are released. However, calculating the reporting unit’s total liability based on which level of the business the liability threshold is applied is more complex, for this reason all three business level threshold approaches are reviewed in Diagram 6.
Sectors that involve transport equipment can be more complex, as transport equipment emit outside the geographic boundaries of a facility but under the facility owner’s operational control. No detail is provided under most pilot schemes on how this issue will be resolved. The Australian ETS (known as the Carbon Pricing Mechanism (CPM)) and the method used for the aviation sector under the Shanghai pilot scheme are discussed below, as possible approaches:

**Australian CPM approach to facility boundaries for the transport sector:**
Under the Australian CPM scheme it is required that transport facilities are separated into regional areas (in this case states) with all activities in that state included in that facility’s report. Where no detail regarding the facility boundaries of the transport sector are given under the pilot schemes as yet, the Australian approach is easily transferrable to a provincial based model.

**Shanghai ETS approach to facility boundaries for the aviation sector:**
The Shanghai DRC guidance for quantification and reporting for the aviation sector deals with the complexities of the transport sector by requiring emissions from all aircraft under the operational control of the aircraft’s owner be reported with exceptions of:
- International flights including Hong Kong, Macau and Taiwan
- Non-commercial aviation including ferrying flights and training flights
- The portion of flights conducted by the aircraft that are under the operational control of another enterprise.

**Special case: Joint Ventures**
Facilities that have joint ownership require more complex analysis to assess which enterprise is required to report. There are two common approaches that may have different outcomes for enterprises; these are explained in the box below.

**Common reporting approaches for joint ventures:**
- The owner with operational control over the facility is required to report and is liable for the emissions from that facility. This enterprise can then pass on any carbon costs for the facility by equity share to split the costs (as depicted in Diagram 7).
- Each Joint Venture (JV) owner of the facility is responsible for the percentage of emissions equivalent to their equity share. This approach has a drawback as no one enterprise is required to put procedures in place to make sure the monitoring and quantification of emissions is conducted appropriately. The second approach is referenced in the Shenzhen DRC guidance document for scenarios where a facility has joint ownership.

![Diagram 7: Reporting approach for facilities with JVs](image-url)
Covered emissions

All pilot schemes cover emissions of the greenhouse gas carbon dioxide (CO₂) only. The pilot schemes may be expanded in the future to cover methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF₆). All pilot schemes cover emissions from direct sources and indirect sources.

The definition of ‘indirect emissions’ under all pilot schemes is consistent and relates to emissions from the use of electricity and heat (including the use of steam).

However, the definition of ‘direct emissions’ sources vary between pilot schemes. For example, the ‘direct emissions’ definition from the Shenzhen Market Supervision Administration guidance “Specification with guidance for quantification and reporting of the organization’s greenhouse gas emissions” covers emissions from four areas:

- Emissions from stationary combustion
- Emissions from mobile combustion (transport fuel)
- Process emissions (including biological, physical or chemical processes that produce greenhouse gas emissions)
- Fugitive emissions (intentional or unintentional discharges, including equipment junction leakage, refrigerant leakage, anaerobic wastewater treatment)

This definition covers greenhouse gas emissions other than CO₂, e.g. refrigerant leaks emit HFCs. These types of greenhouse gases may be required for reporting purposes but would not form part of an enterprise’s liability.

‘Direct emissions’ under the Shanghai pilot scheme only covers stationary combustion, mobile combustion and process emissions but do not include fugitive emissions. The definition of ‘Direct emissions’ under the Beijing pilot scheme is similar to the Shanghai pilot scheme but excludes mobile combustion. All pilot schemes have exemptions for emissions from the combustion of biofuels and biomass as these are counted as renewable energy sources. Given the differences in the emissions sources that are required to be reported between the pilot schemes, enterprises will need to be aware of which emissions sources they are required to report on so they don’t under or over report their emissions totals.

If enterprises are uncertain about which emissions are required to be reported a conservative approach should be taken. Emissions sources can always be omitted from liability reports as necessary and enterprises will find they obtain a greater understanding of their emissions profile and be better prepared for the introduction of a national scheme by following a conservative approach.

Allocation of quotas

Each pilot scheme uses a different method to allocate free quotas that has been determined by the provincial DRC. Some of the pilot schemes use enterprise specific historical emissions data as a basis for the quota allocation. Using enterprise specific historical data means that all enterprises are equally treated and does not favour enterprises that are more energy efficient than others in the same sector.

Emissions abatement gets more expensive as enterprises become more energy efficient. In theory, this means less energy efficient enterprises get a financial advantage as they can abate emissions at a cheaper cost per tonne of abatement and sell this excess abatement through the carbon market. Therefore, this approach favours less energy efficient companies. However, it is the simplest approach and reduces the level of administration involved in the allocation process.

Another approach used by provincial DRCs is to use the average historical emissions intensity of each sector based on units of production or units of revenue to allocate quotas. Allocations can then be based on the expected production or revenue volumes of enterprises in future years. This method rewards energy efficient enterprises compared to their less efficient competitors as they will receive similar sized quotas if production volumes are the same, whilst having lower liabilities. This approach has a higher administrative burden than an enterprise specific quota as comparing like for like production and revenue data across sectors is complex.

All provincial DRC’s responsible for the quota allocations in the pilot schemes say they will take into account either expected future production or the emissions profile of each sector to calculate enterprises’ quotas. This means energy efficient enterprises should have some advantage over their less efficient competitors and enterprises may not be able to use a reduction in production as a method to reduce their emissions below their quota. The Shenzhen and Shanghai pilot schemes have released detailed advice on the quota allocation method as described in the boxes below.

**Shanghai quota allocation process:**

Quotas allocations will be conducted on a one-off basis for the period of 2013 to 2015. These quotas will be based on an enterprise’s historical emissions during the period 2009 to 2011, with consideration of the enterprise’s expected future development. Reporting and surrendering of quotas is required annually with the compliance year running from January to December. Compliance reports will be due by 31 March of the following year and the DRC will organise third party verification of reports by 15 April. Quotas will then be surrendered through registries accounts between 1-30 June of the following compliance year.

**Shenzhen quota allocation process:**

Shenzhen will use an online allocation system to allow enterprises to request their 2013 to 2015 quotas. This allocation will be based on the enterprise’s expected future production and is generated by the system using the enterprise’s data. Enterprises can then accept these quotas if they agree with the output or hold further discussions with the Shenzhen DRC if they do not accept the automatic quotas. Reporting and surrendering of quotas is required annually.
New entrants have been discussed in some pilot schemes’ quota allocation processes. Under most pilot schemes a proportion of the pilot scheme’s annual emissions cap has been reserved for new entrants. The reversed allocation is then assigned to new entrants based on a low-carbon benchmark of emissions intensity of each sector, calculated from other enterprises’ historical emissions data.

So far there has been limited detail in the published guidance documents regarding reporting requirements in the situation where there is a change in an existing enterprise’s emissions profile due to an unplanned increase or decrease in production, such as an acquisition or merger. Some pilot schemes will take into account any planned enterprise changes that are disclosed to the provincial DRC during the allocation process. However the impact of any unplanned changes on an enterprise’s quota is not discussed. If not addressed by the pilot schemes this may lead to large differences between quota allocations and the number of carbon units required to be surrendered by an enterprise. The financial impact of this outcome will need to be considered during the scoping stage of any unplanned acquisition or facility shut down.
Borrowing and banking of permits

Banking of carbon units allows an enterprise to carry over excess carbon units from their allocation quotas or from extra units purchased through the carbon exchange during the current compliance year for use to meet their carbon liability in future years. Borrowing of carbon units refers to allowing enterprises to use carbon units from a future year’s quota allocations to meet their carbon liability for the current compliance year. All pilot schemes state banking of permits between compliance years will be allowed, however borrowing of permits from future years for compliance in the current year is prohibited. One exception to the borrowing restriction is for pilot schemes that intend to allocate quotas for the period 2013-2015 in a single upfront allocation. In this case enterprises may find themselves with a large carbon unit excess or deficit in the final 2015 compliance year if they do not ration units proportionally during this period.

Reporting requirements

Each pilot scheme requires specific details to be supplied with an enterprise’s emissions report to be compliant with the MVR requirements. The details required to be submitted in the annual covered emissions reports have been released for Shenzhen and Shanghai pilot schemes. These details can be used as a guide for enterprises reporting under other pilot schemes, however there will be variations between the reporting requirements of each pilot scheme and enterprises will need to keep abreast of the development of detailed reporting requirements for the pilot scheme they are covered by. Table 3 outlines the information required to be reported on as per the Shenzhen and Shanghai guidance.

Table 3: Reporting requirements under the Shanghai and Shenzhen pilot schemes

<table>
<thead>
<tr>
<th>Shanghai ETS:</th>
<th>Shenzhen ETS:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Company information</td>
<td>• Company information and personnel responsibility</td>
</tr>
<tr>
<td>• Emissions boundaries (organisational and facility boundaries)</td>
<td>• Organizational boundaries</td>
</tr>
<tr>
<td>• Covered emissions total</td>
<td>• Covered emissions total</td>
</tr>
<tr>
<td>• Monitoring plan information:</td>
<td>• Compliance period covered by the report</td>
</tr>
<tr>
<td>• Development of monitoring plan</td>
<td>• How biomass or biofuel combustion emissions were dealt with</td>
</tr>
<tr>
<td>• Changes in the monitoring plan</td>
<td>• Explanations for any exclusions of source of greenhouse gases</td>
</tr>
<tr>
<td>• The actual monitoring</td>
<td>• Selected historical base year and the base year greenhouse gas inventory</td>
</tr>
<tr>
<td>• Monitoring plan consistency and monitoring methods selected</td>
<td>• Explanations for any modification or recalculation of the base year or other greenhouse gas data</td>
</tr>
<tr>
<td>• Depending of monitoring method selected, the following information is required about the monitoring process:</td>
<td>• Clarify the choice of quantification methodology or specifying the reference</td>
</tr>
<tr>
<td>• Calculation method based on time:</td>
<td>• Explanations for any changes made to the quantification methodology which has been chosen</td>
</tr>
<tr>
<td>• Source of emission factors for each combustion emissions source</td>
<td>• Documents or references of the adopted emission factor</td>
</tr>
<tr>
<td>• Source of quantity measurements</td>
<td>• Measurement method based on time:</td>
</tr>
<tr>
<td>• The division of process emissions by raw materials (finished or semi-finished products)</td>
<td>• Measuring emission value</td>
</tr>
<tr>
<td>• Consumption type of direct emissions</td>
<td>• Continuous measurement of time</td>
</tr>
<tr>
<td>• Value of emission factors and quantity measurements</td>
<td>• Related operating instructions</td>
</tr>
<tr>
<td>• Consumption of purchased electricity and thermal emissions from heat</td>
<td>• Uncertainty parameters and the methods used to reduce uncertainty</td>
</tr>
<tr>
<td>• Material balance method:</td>
<td>• Other circumstances should be described (such as CO2 clearance)</td>
</tr>
<tr>
<td>• Input quantity</td>
<td>• Statutory declaration</td>
</tr>
<tr>
<td>• Output quantity</td>
<td></td>
</tr>
</tbody>
</table>
Record keeping requirements

A list of records required to be held under the Shanghai pilot scheme are given in the final guidance and are set out in Table 4. These documents are required to be held for five years, which is consistent with international emissions reporting standards. For most pilot schemes no guidance on record keeping has been issued, therefore five years is the minimum recommended period to retain emissions information and supporting evidence for all emissions reporting.

Table 4: Shanghai record keeping requirements

<table>
<thead>
<tr>
<th>Shanghai ETS: Documents required to be held</th>
</tr>
</thead>
<tbody>
<tr>
<td>• When using approaches based on calculation, the following should be kept:</td>
</tr>
<tr>
<td>• Materials on activity level data acquisition (such as: original evidence/records of activity level data, relevant records/evidence on detection data)</td>
</tr>
<tr>
<td>• Uncertainty and explanations on how to reduce uncertainty.</td>
</tr>
<tr>
<td>• When using approaches based on measurement, the following should be kept:</td>
</tr>
<tr>
<td>• Certification documents of measurement devices issued by relevant authorities</td>
</tr>
<tr>
<td>• All raw data of continuous measurement (including the recorded data of each change, test, calibration, use and maintenance)</td>
</tr>
<tr>
<td>• Uncertainty and explanations on how to reduce uncertainty</td>
</tr>
<tr>
<td>• Calculation verifications all stored content based on calculation should be kept</td>
</tr>
<tr>
<td>• Management materials on greenhouse gas emissions monitoring data quality control record file</td>
</tr>
<tr>
<td>• Data quality control records</td>
</tr>
<tr>
<td>• Annual emissions report</td>
</tr>
</tbody>
</table>

Verification

Verification is an important part of emissions reporting as it ensures data is accurate and complete. Most of the pilot scheme designs require third party verification over historical baseline emissions data and emissions reports that will be submitted in the future. This will generally occur after the emissions report is issued but before quotas are surrendered for the compliance year. The verification process is administered by the provincial DRC typically using a list of approved verification enterprises. Some schemes require enterprises to change verifiers after a set number of years, for instance the Shenzhen scheme requires a change of verifier at least every three years.
Part 3: Financial implications of emissions trading
Accounting considerations

There is a range of accounting and financial reporting implications that enterprises will need to consider relating to ETSs. This section discusses some of the implications that could arise from the pilot schemes and introduction of a national ETS, particularly if an enterprise reports under International Financial Reporting Standards (IFRS). However, the implications will depend on the known details of the pilot schemes or potential national ETS, an entity's individual circumstances and an entity's specific financial reporting and compliance requirements. The most immediate implication will be any impact on asset valuations due to the pilot schemes, in particular whether or not an entity's impairment models are impacted and whether this results in any impairment being recognised. If the NDRC announces any further national ETS details, other enterprises operating outside the pilot provinces may need to consider the impact on their asset impairment models as well. As such, impacted enterprises will have a need to re-evaluate the appropriateness of asset impairment valuation models used – for both value-in-use and fair value measures – and re-assess assumptions used in those models. Given that uncertainty still exists around the magnitude and length of pilot schemes and the possibility of a national ETS, preparers of financial statements will need to consider what disclosure might be necessary. For example, it may be appropriate to consider disclosing the assumptions used in impairment testing, including for the period the ETS is assumed to operate, the size of the potential impact and the sensitivity of those assumptions.

Other accounting and financial reporting issues will need to be considered if the enterprise reports under IFRS. The International Accounting Standards Board (IASB) has yet to finalise accounting requirements for emissions-related assets and liabilities. Therefore, entities operating under ETSs and similar schemes in other jurisdictions such as Europe, Australia and New Zealand have had to develop their own accounting policies based on the requirements of IFRS. This has led to a range of accounting approaches for ETS emerging. Thus individual enterprises will need to determine how to account for free emissions quotas, emissions liabilities and quotas purchased and sold through a carbon exchange. In the absence of specific requirements, issues to consider include:

- Recognition and measurement of a liability for direct and indirect covered emissions
- Recognition and measurement of purchased emission quotas and allocated free quotas
- Accounting for the sale of allocated quotas
- Accounting for the sale and purchase of emissions quotas sold or purchased on an exchange or via over the counter contracts
- Amortisation and impairment testing of emissions quotas
- Accounting for emissions offsets credits, CCERs
- Accounting for any compensation received for closure assets that own free emissions quotas

- Accounting for the tax implications of the various aspects of an ETS
- Valuation of quotas as part of a business combination
- Appropriate financial statement disclosures

Fraud and penalty implications

Provincial DRCs have discussed two types of penalties for non-compliant enterprises:

1. Financial fines imposed on the enterprises. Both Shanghai and Shenzhen DRCs have identified they will adopt this type of fine as outlined in the box below.

2. Special treatment by the provincial government for enterprises that don’t comply. This could include not approving new projects or expansions or not allowing the enterprise to apply for any special funding.

<table>
<thead>
<tr>
<th>Shanghai:</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Shanghai pilot scheme state three different degrees of financial penalties:</td>
</tr>
<tr>
<td>- Non compliance of reporting:</td>
</tr>
<tr>
<td>Fine between CNY10,000-30,000</td>
</tr>
<tr>
<td>- Non compliance of verification:</td>
</tr>
<tr>
<td>Fine between CNY10,000-50,000</td>
</tr>
<tr>
<td>- Non compliance of surrendering quotas:</td>
</tr>
<tr>
<td>Fine between CNY50,000-100,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Shenzhen:</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Shenzhen and other schemes have stated a penalty of three times the average market carbon price for not surrendering the required volume of quotas.</td>
</tr>
</tbody>
</table>

Contract review considerations

Enterprises will need to review their ability to pass on any costs from purchasing carbon quotas or offset permits to customers. Passing on the costs will also affect enterprises which are not big emitters but whose input costs increase under a carbon price. Enterprises should consider their ability to adjust prices to recover any costs by reviewing current contractual arrangements, regulatory constraints and market conditions.

Power generators and other sectors that operate in a regulated environment may have limited capacity to pass through costs to end users. These sectors may wish to review the price paid for different inputs such as fuel types and fuel qualities to incorporate the extra carbon cost of more emissions intense fuel sources into budgets and forecasts.
Opportunities to minimise your financial impact

Enterprises have two basic ways to improve their financial returns under the pilot schemes:

1. Reduce emissions below quota allocations by implementing internal emissions abatement projects. To do this in the most cost effective way enterprises must understand their internal cost of abatement.

2. Trade quota allocations through carbon exchanges to cover emissions liabilities at least cost or generate revenues through selling excess quotas. To do this in the most cost effective way enterprises must understand the market price or external cost of abatement.

Optimising your carbon trading strategy will involve using a combination of these options. Assessing opportunities for internal and external abatement are discussed in this section.

Minimising costs through internal abatement

Immediate actions to drive down emissions and energy:

1. Map your carbon exposure across the supply chain
2. Develop a Marginal Abatement Cost Curve
3. Identify and consider CCER opportunities

As the basic principal of the pilot scheme is to assign each enterprise an emissions quota. If the enterprise pollutes above this quota they will incur the financial cost of buying carbon units whilst selling excess quota and receive revenue for the emissions below the quota. This means enterprises operating under a pilot scheme now have a financial impetus to reduce emissions if the cost of reducing the emissions is below the market price of carbon. Emission abatement projects can be assessed in terms of CNY/t CO₂ and least cost abatement projects can then be identified and implemented as required. Identifying projects in this manner is known as identifying your marginal abatement cost curve (MACC), an example enterprise specific MACC is shown in Diagram 8.

A MACC allows a company to assess the cost and magnitude of emission reduction projects. Utilising existing indicators of price such as the pilot schemes already operating and the global Certified Emissions Reduction (CER) price, enterprises can identify which projects from the MACC that should be considered in capital spending programs and what are optimised for financial returns under an ETS. Diagram 9 outlines what this means, regardless of whether you are liable, and what you can do to manage your exposure.

Companies will need to develop optimal carbon abatement and trading strategies using this flow diagram to maximise the benefit of a pilot scheme for their enterprise. Not considering the options early may result in being uncompetitive against those that do.

Diagram 8: Enterprise specific MACC output
Minimising costs through emissions trading

Each enterprise receives freely allocated emissions quota for each compliance period under the pilot schemes. If this emissions quota is less than the enterprise’s emissions in the compliance period the enterprise is required to purchase the difference on the carbon exchange and if the quota is above the enterprise’s emissions the enterprise can sell the excess quota on the carbon exchange.

If an enterprise is a buyer on the exchange they have two types of carbon units they purchase:

- They can buy excess emissions quota of another enterprise covered under the pilot scheme
- They can buy Chinese emissions offset credits, CCERs

Both types of units are traded through carbon exchanges and can trade at different prices due to a cap on the proportion of CCERs that an enterprise can use of between 5-10% of an enterprise’s total liability, depending on the pilot scheme design.

Only spot trading is allowed in carbon markets. All types of derivatives are currently banned. Most pilot schemes do not allow financial speculators to participate in the carbon markets. However there are some exceptions to this regulation such as in Shenzhen.

Preparing to participate in a carbon market, and where to start, can be an overwhelming task for many enterprises, as most do not have existing processes in place that can be leveraged. The following elements are critical in participating in a pilot scheme:

- Governance and risk management
- Trading infrastructure

Governance and risk management

The trading of carbon units requires strict governance and risk management processes. It is critical that your governance framework and risk management policies be updated to incorporate carbon trading. This task is likely to be undertaken by the Treasury function (or the energy commodity trading function, if one exists) who are best equipped to understand the unique risks associated with trading and managing cash flow.

Companies already trading in financial products (such as foreign exchange) will be able to leverage from existing governance frameworks and risk management policies making this task less complex. For those that are less sophisticated, a greater level of effort will be required.

Details of the key considerations associated with developing your governance framework are provided in Table 5.
Table 5: Considerations for developing a governance framework

<table>
<thead>
<tr>
<th>Considerations</th>
<th>Key questions to ask</th>
</tr>
</thead>
</table>
| Ownership and accountabilities         | • Who is liaising with carbon exchanges and financial intermediaries?  
• Who is responsible for, and has access to the company’s carbon unit account?  
• Who are the decision makers and approvers?                                                                                                                                 |
| Carbon unit account                    | • Have you registered with the provincial carbon exchange so your business is ready to trade if required?                                                                                       |
| Carbon procurement strategy            | • When will your business review your carbon liability and decide if it’s required to purchase carbon credits?  
• Will there be any investment in CCER projects?  
• What role will Treasury play in approving spends?                                                                                                                                 |
| Carbon position limits                 | • What are your trading limits?  
• Are there clear delegations of duties, so trading limits are adhered to?                                                                                                                                 |
| Carbon position reporting              | • Are there clear lines of reporting?  
• Have you established segregation of duties between front, middle and back office responsibilities?                                                                                     |
| Regulatory and legal risk and implications | • Does someone in the business have detailed knowledge of the requirements and provincial guidance of the pilot scheme?                                                                   |

Trading infrastructure

Enterprises will also need to make sure they have the correct infrastructure in place to be able to participate in provincial carbon markets. The infrastructure requirements will most likely cross divisions from facility level emissions measuring devices to Treasury level carbon trading systems. To effectively manage carbon risks enterprises will need to ensure infrastructure is incorporated smoothly between divisions and functions. A list of common infrastructure requirements is provided in Table 6.

Table 6: Infrastructure requirements for carbon trading

<table>
<thead>
<tr>
<th>Area</th>
<th>Required infrastructure</th>
</tr>
</thead>
</table>
| MRV           | • Facility level measuring devices  
• Facility or enterprise level systems to aggregate measurement data and convert into format for emission reporting  
• A manual covering enterprise policies and procedure for emissions trading |

Lessons learnt from overseas markets

From prior experience from the implementation of an ETS in Europe, to maximise financial outcomes businesses need to be aware of their carbon liability during the compliance period and not leave trading requirements until the surrender date. For Chinese enterprises this requires monitoring of emissions in as close to real time as feasible and trade quotas throughout the compliance period, to smooth the carbon price paid.

European example of the benefit of real time trading:

In the early phases of the European Union’s ETS, carbon units (called European Union Emission Allowances (EUAs)) were freely allocated, with only approximately 5% auctioned overall. The large power generating companies, who had previous experience in trading electricity, tracked ‘real time’ obligations, based on every megawatt of electricity (and therefore greenhouse gas emissions) produced and subsequently traded in line with this profile - selling on excess or acquiring shortfall EUAs on a daily basis. In contrast, most liable entities that were allocated EUAs were not well prepared for trading or did not know their forward emissions profiles - as a result these parties held onto their EUAs assuming they would either need them to cover their obligations, or that any excess EUAs could be sold.

As Phase I (2005-2007) of the EU ETS came to a close and liable parties reported their emissions it became clear that the market had an over-supply of EUAs that could not be carried over into Phase II (2008-2012). So when the less prepared entities came to sell their excess EUAs at the end of Phase I the price was substantially lower than it had traded throughout the majority of the Phase I. It was those parties who had actively tracked their liabilities and positions throughout the Phase that managed the price volatility better.
Part 4: So what now for your enterprise?
Timing is critical. With the pilot schemes coming into effect now and the expectation of further emissions and energy regulations due in the 13th Five Year Plan including the potential of a national ETS, understanding the monitoring and reporting requirements of your emissions and energy profile is imperative to staying competitive.

The Quick 10 step implementation checklist provides you with some immediate actions to consider. If you would like to discuss your next steps further, our multidisciplinary climate change team is ready to work with you.

‘Quick 10 step action plan’ for reporting your emissions and energy profiles

1. Establish responsibilities within your business to manage emissions monitoring, reporting and trading
2. Identify your emissions reporting and liability requirements and develop systems for compliance, including internal compliance manuals that cover company emissions reporting and trading policies and procedures
3. Look at joint venture agreements and confirm or agree who will take on liability
4. Validate the quality of your emissions data and plan to gather and review emissions data in close to real-time to help assess carbon liabilities accurately
5. Develop Marginal Abatement Cost Curve to assess the internal cost of reducing emissions to establish a hierarchy of investment under:
   a. The expected future carbon price
   b. A range of scenarios for changes in energy costs and project changes
6. Seek advice of emissions trading infrastructure and strategy
7. Develop models to assess the impact of a carbon price from upstream suppliers
8. Assess strategies to pass on the carbon pricing costs to downstream customers and markets
9. Develop your accounting treatment policy
10. Determine asset valuations and perform fully costed impairment tests

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