PG&E appreciates the opportunity to comment on scenarios or design elements that could adversely affect market efficiency, create incentives for participants to fail to comply with market rules or reduce the effectiveness of market monitoring. We believe that the complex market rules and interactions with other markets such as power and fuel do create the potential for market issues that need to be carefully addressed.

To help make the discussions most productive, PG&E suggests that further details regarding the June 7th meeting be provided to stakeholders, such as:

1. Will this meeting include a whiteboard exercise to walk through potential scenarios that affect market functionality? If not, is such an exercise planned for the future?
2. Format of such white-board discussions - what will these sessions look like?
3. What type of participants would the Market Simulation Group (MSG) prefer to be involved in the white-board discussions (traders, lobbyists, system engineers, etc.)?
4. How will the discussions be structured to encourage open dialogue?
5. How can stakeholders best prepare for these discussions?
6. What are the expected outcomes from the discussions and what is the timing of results?
7. How will the results be used to influence regulation/market design?

In general, we are concerned about volatility in allowance prices, which strengthens incentives to game the market by increasing the potential profit for a given volume, and also leads to market inefficiencies. Potential drivers of volatility include:

- Lack of liquidity
- A fixed number of allowances
- Requirements to meet compliance obligations
- A steep (inelastic) abatement curve once offset availability is exceeded at annual and especially shorter timescales

The remainder of our comments are classified broadly under market inefficiencies and incentives to skirt the market rules.

Market Inefficiencies

- Holding limits
    - The application of uniform holding limits to entities with widely varying compliance obligations
    - Market simulation should examine impact of various distributions of holding limits
- Other non-ARB regulatory restrictions, e.g. PUC, Dodd-Frank, CFTC
- Potential disappearance of liquidity providers in middle market
    - Dealers, risk intermediaries such as funds and trading shops
- Possibility that entities with an environmental mission could significantly shorten the market by buying up allowances
- Asymmetric oversight risk – IOUs, financial entities and potentially oil and gas providers face greater scrutiny after the fact than do less regulated enterprises
- Asymmetric requirements – entities that have to consign their free allowances have more risk exposure than entities that do not

- Likewise, entities that do not receive free allowances have more risk exposure than (non-consigning) entities that do
- CP1 to CP2 allocation transition and increase in cap, inclusion of new sectors

Uncertainty in regulations and external factors have already affected allowance prices on the exchanges and implied heat rates in electricity forwards and will continue to do so. Such uncertainties include the following:

- Definition of resource shuffling (this will require overlay of power market into simulation)
- Offsets
    - Supply or timing (protocol development and supply growth)
    - Buyer's liability and invalidation risk
    - Connectivity and security of MTS and offset registries
- Legal uncertainty regarding
    - Low Carbon Fuel Standard (since it affects demand for compliance instruments)
    - Use of offsets
    - Resource shuffling and first deliverer definitions
- Status of program after 2020 – will allowances be worthless or very valuable after end of program; when and with what warning will decision be made?

Incentives to Game the Market

- Potential collusion between parties to gain effective market power
- Limited depth of Allowance Price Containment Reserve with no defined procedure to refill
- Auction and Price Containment Reserve – simulations should address
    - Timing and success of auctions
    - Scenarios for rollover of unsold volumes
    - Scenarios where prices reach reserve levels and qualified participants participate or don't participate
    - Scenarios where reserve allowances are depleted and the containment price is exceeded
- Timelines for compliance showing at end of each compliance period (especially in Quebec, where there is no annual showing)
- Test allowance parking, i.e. structuring swaps to preserve physical forward supply
- Non-standard transactions such as swaps and sleeves
- Cross-market manipulation – various schemes that rely on impact of GHG prices on current and forward electricity prices, fuel prices, and generation dispatch decisions
- Influence of banking on market dynamics
- Influence of legal challenges to supply (e.g. offsets) or demand (e.g. resource shuffling, entire program) on compliance instrument costs

The foregoing is of necessity a compressed list of scenarios and market design elements that could impact market efficiency and incentives to skirt the market rules.

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