

Appendix 1 – EMA’s Responses to Respondents’ Feedback

Q1. Apart from relaxing specific legal and regulatory requirements, what are other possible forms of support that can be provided for the duration of the Sandbox to encourage more experimentations in the electricity and gas sectors?

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<i>Dr Victor Wong (Provided as independent feedback)</i>	
<p>Para 2.2: The “Applicant” is the interested firm. The Applicant is limited to only the private sector. Can the applicant be other parties including from other agencies? There are many interesting innovations in academia and other government agencies.</p>	<p>EMA has rephrased “an interested firm” as “an interested party/parties” to make it clearer that i) EMA is not limiting applications to those from the private sector only; and ii) that EMA is open to applications from consortiums.</p>
<p>Para 2.2: “EMA will also support the sandboxing of similar products and services”.</p> <p>Is it the intention here to create a list of technologies to be given in the Sandbox? I don’t think that a shopping list concept is practical. It also discourages innovative ideas from being proposed to be listed publicly as this would give away the innovative edge.</p>	<p>EMA has rephrased the paragraph as “EMA may also support the sandboxing of similar products and services <u>that could run concurrently</u>” to provide clarity that we may consider the sandboxing of products and services that are already available in the market, as long as they meet the requirements stated in sections 7 and 8 of the determination paper.</p> <p>There is no intention to create a list of technologies for the purpose of sandboxing - EMA will consider the sandboxing of innovative products and services that have the potential to benefit the electricity and gas sectors in Singapore.</p>
<p>Para 2.3: The Sandbox should be to support partnerships already forged before they apply to the Sandbox. The Applicant would typically have pre-identified suitable partners to explore and develop innovations jointly. Presumably this alleviates the tendering process.</p>	<p>EMA is open to applications from consortiums. For such partnerships, we request that applicants include the details of the lead entity and all involved entities in the application template, which is available as Annex A of the determination paper.</p>
<p>Para 2.4: “EMA will not be providing any funding.”</p>	<p>EMA notes the comment.</p>

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<p>If no funding is to be provided, then it appears that the main focus here is just to explore relaxing the regulatory requirements. Any follow-up mechanisms then should be to expedite the submission of proposal.</p>	
<p><i>EDF Lab Singapore</i></p>	
<p>It is clear from the consultation paper that EMA would look at relaxing the appropriate legal and regulatory requirements for the specific trials in the sandbox. To give a greater confidence to the innovators, EMA could also provide some support on the sandbox trials as follows:</p>	-
<p>Clarity on how EMA would enforce certain regulatory requirements within a specific time frame.</p>	<p>The Applicant may wish to include proposed exemption/temporary relaxation of specific legal and regulatory requirements prescribed by EMA as part of its proposal, as well as alternative safeguards that can be put in place. EMA will then consider providing the appropriate regulatory support for the duration of the Sandbox. The duration of the sandbox, boundary conditions and risk-mitigating measures will be agreed upon between EMA and the Applicant during the evaluation stage.</p>
<p>Guidance on the interpretation or compliance with the regulatory requirements, or a set of guidelines. Which innovators can rely on and refer to for the defined trial period?</p>	<p>Applicants can engage EMA for enquiries, clarifications or discussions through the EMA Policy & Planning Department, or via email (sandbox@ema.gov.sg).</p>
<p>Openness to collaboration via consortiums or use of external funds and support for the purpose of the trial</p>	<p>EMA is open to collaboration via consortiums or the use of external funds and support for sandbox projects.</p>

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Clarity on the strategy for Singapore’s power industry and its strategies moving forward (e.g. KPIs for decarbonisation strategy, price reduction strategies, etc.)	Applicants may refer to our corporate website (www.ema.gov.sg) for information on Singapore’s energy sector and EMA. Alternatively, applicants may submit their queries via email to sandbox@ema.gov.sg .
Support on the partnerships with key industry players like distribution and transmission owner Singapore Power and other energy retailers on the sandbox trials. (i.e. How these stakeholders are involved in the sandbox?) Facilitation on the collaboration with other agencies as required within and beyond the trial.	EMA appreciates the suggestions and acknowledges that there is a wide range of support that can complement the regulatory support provided in a sandbox. Applicants can continue to engage EMA to discuss the relevant areas of potential support for EMA to explore.
In addition to the regulatory relaxations, the sandbox may also face some risks when deploying of technologies in the actual field compared to laboratory solutions. The innovator will need to mitigate these risks, but requires clarity from EMA on how the risks will potentially be rated from a regulatory perspective.	Applicants can engage EMA for enquiries, clarifications or discussions through the EMA Policy & Planning Department, or via email (sandbox@ema.gov.sg).
<i>Energy Market Company Pte Ltd</i>	
Other forms of support that can be provided for the duration of the Sandbox include provision of regulatory advice, market data and simulations (subject to cost recovery by service providers).	EMA appreciates the suggestions and acknowledges that there is a wide range of support that can complement the regulatory support provided in a sandbox. Applicants can continue to engage EMA to discuss the relevant areas of potential support for EMA to explore.
<i>ExxonMobil Asia Pacific Pte Ltd</i>	
EMA could support by providing a single point of contact who could liaise with the various statutory boards and regulatory bodies to	EMA appreciates the suggestions and acknowledges that there is a wide range of support that can complement the

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<p>facilitate and expedite Sandbox implementation. This saves time and resources if EMA is the advocate with power and influence to fast-track processes and remove obstacles; this indirectly reduces time and resources which are the essence to Sandboxes successes. For electricity, there are numerous interfaces with EMC & Singapore Power. It helps if these bodies are aligned removing inefficiencies of sandbox implementation downstream of the regulatory body.</p>	<p>regulatory support provided in a sandbox. Applicants can continue to engage EMA to discuss the relevant areas of potential support for EMA to explore.</p>
<p>The code of practices/Statutory Acts are sometimes difficult to interpret. EMA could provide the necessary assistance to the sandbox applicants to smoothen the application process.</p>	<p>Applicants can engage EMA for enquiries, clarifications or discussions through the EMA Policy & Planning Department, or via email (sandbox@ema.gov.sg).</p>
<p>GreenSync</p>	
<p>We believe that a regulatory sandbox environment should contain two additional elements:</p> <ul style="list-style-type: none"> a. No compliance action taken for inadvertent breaches; and b. An information reporting and transparency framework <p>First, we request that the EMA make explicit that any inadvertent breach of the existing regulations which arises from the new technology not be subjected to compliance sanctions. While all technology businesses conduct due diligence to ensure that they understand and comply with all relevant regulatory provisions, the nature of all energy market legislation, which are typically designed around a historical technological paradigm and the interaction with the new technology can have unintended consequences.</p> <p>One of those consequences may, by some interpretations, be considered to be a breach of the regulations. We believe that the</p>	<p>EMA will assess such circumstances on a case-by-case basis. The Applicant may wish to include proposed exemption/temporary relaxation of specific legal and regulatory requirements prescribed by EMA as part of its proposal, as well as alternative safeguards that can be put in place. EMA will then consider providing the appropriate regulatory support for the duration of the Sandbox. The duration of the sandbox, boundary conditions and risk-mitigating measures will be agreed upon between EMA and the Applicant during the evaluation stage. However, the</p>

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<p>intent of the sandbox is to test the limits of the legislation. In some cases, those limits will be stretched beyond its current boundaries. However, we do not believe that this would warrant any action be taken by the EMA. We note that the EMA proposes that if a condition is breached, that the sandbox trial be discontinued. As we discuss in our response to Question 5, we do not believe that this grounds for discontinuing the trial.</p>	<p>sandbox will be discontinued should the risk posed to customers or the energy sector outweighs the benefits of the product/service under experimentation.</p>
<p>Second, we believe that the market would benefit from the EMA establishing a transparency and information sharing arrangement which provides information on the success or otherwise on the trial. We note that the criteria has some minor information reporting provisions, such as the name, the start and expiry dates of the Sandbox experimentation and a broad description of the Sandbox. However, we propose a stronger information sharing framework be established. This will encourage new technology providers to leverage off those learnings and potential develop solutions to address any challenges identified in the trial, or to build on the existing trial and improve outcomes for future trials.</p>	<p>As stated in the Framework, relevant information on all approved Sandbox applications such as the name of the Applicant, the start and expiry dates of the Sandbox experimentation and a broad description of the Sandbox will be published on EMA’s website. For confidentiality reasons, the sharing of any additional information will require the Applicant’s agreement.</p> <p>Any permanent changes to existing regulations will only be made after an industry-consultation process.</p>
<p>We also encourage the EMA to actively monitor each of the proposed trials and provide specific guidance to the market on how they see the trial resulting in changes to the market framework or specific provisions that might need to change to improve the potential outcomes.</p> <p>Historically an annual reporting framework would be sufficient, however the pace of technological innovation suggests that a</p>	<p>As part of the evaluation criteria, applicants are to report to EMA on the test progress based on an agreed schedule that will be established between EMA and the Applicant during the evaluation stage.</p> <p>EMA will actively monitor projects during the duration of the sandbox trials.</p>

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quarterly or semi-annual reporting framework may be more appropriate.	
<i>LYS Energy Group</i>	
With respect to the energy sector, any commercial solution that LYS Energy is bringing to its customer falls under the rules and regulations of many agencies (EMA, Singapore Power, PSO, EMC, NEA etc.). It would be useful if the legal & regulatory support from EMA, through the Sandbox, would be coordinated throughout the various agencies involved so that the experiment can be evaluated for its pure commercial merits, assuming it complies with the technical requirement imposed by such agencies.	EMA appreciates the suggestions and acknowledges that there is a wide range of support that can complement the regulatory support provided in a sandbox. Applicants can continue to engage EMA to discuss the relevant areas of potential support for EMA to explore.
<i>Mr Ng Soo Yong (Provided as independent feedback)</i>	
Start-up eco-system with access to financial advisory, technical advisory, entrepreneurial finance venture capital, mentorship, access to open data and real time data, business partners, collaboration matchmaking, co-working space, manpower, tools that start-ups can harness on, connecting the users, customers in a market trials.	EMA appreciates the suggestions and acknowledges that there is a wide range of support that can complement the regulatory support provided in a sandbox. Applicants can continue to engage EMA to discuss the relevant areas of potential support for EMA to explore.
<i>PacificLight Power Pte Ltd</i>	
Can the EMA develop procedures and guidelines for instances when specific legal and regulatory requirements are relaxed due to approved Sandbox Projects. These guidelines should aim to establish a communication protocol, etc. to ensure that industry are	The Applicant may wish to include proposed exemption/temporary relaxation of specific legal and regulatory requirements prescribed by EMA as part of its proposal, as well as alternative safeguards that can be put in place. EMA will then consider providing the appropriate regulatory support for the duration of the Sandbox. The

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adequately informed of changes in legal and regulatory requirements by the EMA.	<p>duration of the sandbox, boundary conditions and risk-mitigating measures will be agreed upon between EMA and the Applicant during the evaluation stage.</p> <p>Any permanent changes to existing regulations will only be made after an industry consultation process.</p>
<i>Red Dot Power Pte Ltd</i>	
One of the most important aspect of deployment of innovative technologies is that RDP is considering will require “Siting”. That means availability of a proper site location would be a factor for demonstration of the utility of such efforts and EMA may consider this aspect.	As stated in the consultation paper, the proposal should show that the Applicant has secured or intends to secure relevant assets and resources for experimentation, and has clearly defined test scenarios and outcomes. EMA can help to facilitate the necessary link-ups with relevant stakeholders for siting purposes for the purpose of the sandbox.
<i>SembCorp Industries Ltd</i>	
<p>Support such as providing referral and assisting with match making for service providers/consultant firms to gain access to gencos, grid operators, retailers, customers, government agencies, LLE, MNC would be helpful.</p> <p>Expediting approval of related regulatory requirement (e.g. SCDF – Fire Safety Standard for new battery is already approved overseas but not in Singapore yet) would accelerate the whole process and encourage higher efficiency in sandbox.</p>	<p>EMA appreciates the suggestions and acknowledges that there is a wide range of support that can complement the regulatory support provided in a sandbox. Applicants can continue to engage EMA to discuss the relevant areas of potential support for EMA to explore.</p> <p>Similar to other businesses, applicants should seek the necessary approvals as part of their business activity. EMA can help to facilitate the link-ups to the relevant regulatory bodies, if required.</p>
EMA may also wish to take an active role in assisting the project such as providing expert advice (or connecting the applicant to experts that EMA knows) or provide funding by linking EMA’s other	EMA appreciates the suggestions and acknowledges that there is a wide range of support that can complement the regulatory support provided in a sandbox. Applicants can

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<p>funding processes to the applicant’s project. Reducing or removing fees and charges (e.g. grid charges) could be considered too.</p>	<p>continue to engage EMA to discuss the relevant areas of potential support for EMA to explore.</p> <p>EMA will not be providing any funding for proposals selected for the Sandbox. There will also not be any charges levied on the Sandbox Project associated with the running of the Sandbox (e.g. application fee / trial fee).</p> <p>The Applicant may wish to include proposed exemption/temporary relaxation of specific legal and regulatory requirements prescribed by EMA as part of its proposal, as well as alternative safeguards that can be put in place. EMA will then consider providing the appropriate regulatory support for the duration of the Sandbox. The duration of the sandbox, boundary conditions and risk-mitigating measures will be agreed upon between EMA and the Applicant during the evaluation stage. EMA reserves the right to review the relevant charges for successful Applicants on a case-by-case basis.</p>
<p><i>Singapore LNG Corporation Pte Ltd</i></p>	
<p>Support for experimentations in the electricity and gas sectors may not be limited to legal and regulatory requirements only under EMA’s purview. There could be associated issues relating to environmental, safety, security, marine considerations etc. that are under the jurisdiction of other regulatory agencies such as NEA, MPA, MHA and SCDF. Hence support from EMA could be in the form of co-ordinating and facilitating discussions between the Applicant and other relevant government agencies.</p>	<p>EMA appreciates the suggestions and acknowledges that there is a wide range of support that can complement the regulatory support provided in a sandbox. Applicants can continue to engage EMA to discuss the relevant areas of potential support for EMA to explore.</p>

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<i>Sun Electric Pte Ltd</i>	
<p>EMA may want to maintain that there is a fair neutral authority, e.g. a market company, MSSL licensee, or transmission licensee - being only one such registered entity in respect of the legislated designation under the Act - should not be able to exert unfair market power over a market participant involved in the sandboxing/development of innovation. E.g. the sandbox could be used for an innovator to also have a neutral gauge for testing and disclosures to encourage protection of innovation. This could be a purpose of the sandbox.</p>	<p>EMA notes the comment.</p>
<i>Sunseap Group</i>	
<p>Apart from providing the appropriate regulatory support by relaxing specific legal and regulatory requirements, there are three areas EMA can help to assist on:</p>	<p>-</p>
<p>Penalties associated with the existing legal and regulatory requirements:</p> <p>A clause could be included in which the penalties associated with the existing legal and regulatory requirements may be lowered or waived. This clause should be made clear in the proposal upon submission to EMA and will be subjected to EMA’s discretion on a case-by-case basis.</p>	<p>EMA will assess such circumstances on a case-by-case basis. The Applicant may wish to include proposed exemption/temporary relaxation of specific legal and regulatory requirements prescribed by EMA as part of its proposal, as well as alternative safeguards that can be put in place. EMA will then consider providing the appropriate regulatory support for the duration of the Sandbox. The duration of the sandbox, boundary conditions and risk-</p>

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<p>For example, when testing demand charge or contracted capacity reduction with ESS, would it be possible to exempt from uncontracted capacity charges during the sandbox period?</p>	<p>mitigating measures will be agreed upon between EMA and the Applicant during the evaluation stage.</p> <p>Applicants are to note that they will be bounded by the existing rules and regulations where exemptions are not given, and are potentially liable to penalties if there are breaches to these rules and regulations.</p>
<p>Suitable environment for new initiatives:</p> <p>To allow industry to test out new initiatives, EMA could also help by providing actual sites or spearhead discussion with potential partners.</p> <p>Confidential data:</p> <p>Can EMA provide or help obtain otherwise confidential load data? For example, Blockchain accounting of RE/loads can be done in parallel to the existing set-up, so risk is relatively low, but a lot of the detailed data required is in the hands of SP?</p>	<p>As stated in the Framework, Applicants should show that they have secured or intend to secure relevant assets and resources for experimentation, and have clearly defined test scenarios and outcomes.</p> <p>EMA appreciates the suggestions and acknowledges that there is a wide range of support that can complement the regulatory support provided in a sandbox. Applicants can continue to engage EMA to discuss the relevant areas of potential support for EMA to explore.</p>
<p><i>Tuaspring Pte Ltd</i></p>	
<p>Apart from support from relaxing of certain regulatory requirements during Sandbox, EMA could also consider supporting applicants in obtaining commercially non-sensitive transmission level data should any such data be required.</p>	<p>EMA appreciates the suggestions and acknowledges that there is a wide range of support that can complement the regulatory support provided in a sandbox. Applicants can continue to engage EMA to discuss the relevant areas of potential support for EMA to explore.</p>
<p>As participants in the industry, we seek to be informed and regularly updated on any such experiments being conducted under</p>	<p>As stated in the Framework, relevant information of all approved Sandbox applications such as the name of the</p>

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<p>this Sandbox initiatives, including the intended outcome and brief understanding of such experiments being conducted (while maintaining confidentiality of commercially sensitive details).</p>	<p>Applicant, the start and expiry dates of the Sandbox experimentation and a broad description of the Sandbox will be published on EMA’s website. For confidentiality reasons, the sharing of any additional information will require the Applicant’s agreement.</p> <p>Any permanent changes to existing regulations will only be made after an industry-consultation process.</p>
<p><i>PUB, Singapore’s National Water Agency</i></p>	
<p>How about international practices that Singapore should consider for adoption, e.g. FITs, RECs, etc. Would these be covered by the regulatory sandbox?</p>	<p>Applicants can submit their proposals to EMA for evaluation.</p>
<p>Para 2.3: Some of the proposed regulatory sandboxing measures would involve waivers of costs/fees (e.g. network charges), will these be considered?</p>	<p>As stated in the Framework, there will not be any admin/ application fee/trial fees associated with the running of the Sandbox. EMA however, reserves the right to recover costs incurred for the operation of the sandbox from the participant.</p> <p>The Applicant may wish to include proposed exemption/temporary relaxation of specific legal and regulatory requirements prescribed by EMA as part of its proposal, as well as alternative safeguards that can be put in place. EMA will then consider providing the appropriate regulatory support for the duration of the Sandbox. The duration of the sandbox, boundary conditions and risk-mitigating measures will be agreed upon between EMA and the Applicant during the evaluation stage.</p>

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Para 2.3: Could administrative requirements, e.g. registrations and metering also be considered for relaxation?	EMA will provide the appropriate regulatory support by relaxing specific legal and regulatory requirements prescribed by EMA, which the Applicant would otherwise be subject to, for the duration of the Sandbox.

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Q2. Are there any other circumstances or scenarios where the Sandbox might not be suitable> Is the current criteria too restrictive?

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<i>Dr Victor Wong (Provided as independent feedback)</i>	
<p>Para 5.6: Expectation is that the innovation has pre-established proof of concept. Some innovations especially those with risk-taking (business, market and funding?) will not have this. How does this gel with clause 5.2 which mentions risk-taking?</p>	<p>Applicants can submit their proposals to EMA for evaluation. Based on its assessment, EMA can help to facilitate link-ups with other ongoing initiatives (e.g. R&D grant calls), if necessary.</p>
<i>EDF Lab Singapore</i>	
<p>The current criteria could be enhanced by encouraging the innovator to work with EMA to redefine the boundaries of the sandbox whenever possible. This follows the above suggestions that EMA could also provide the regulatory guidance for the trial.</p>	<p>EMA notes the comment. The duration of the sandbox, boundary conditions and risk-mitigating measures will be agreed upon between EMA and the Applicant during the evaluation stage.</p> <p>Applicants can engage EMA for enquiries, clarifications or discussions through the EMA Policy & Planning Department, or via email (sandbox@ema.gov.sg).</p>
<i>ExxonMobil Asia Pacific Pte Ltd</i>	
<p>a. Proposals which are anti-competition or may result in monopolizing of markets b. Proposals with potential environmental hazards or risks c. Proposals with mismatch of potential liabilities (to consumers/stakeholders) where Sandbox applicant/organisation is inadequate in remedying.</p>	<p>EMA notes the comment.</p>

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<i>Gas Supply Pte Ltd & Pavilion Gas Pte Ltd</i>	
<p>In addition to the criteria established in para 5.6, EMA should consider the potential long term implications to energy security and reliability. Innovative solutions are potentially disruptive and it is important to make a preliminary assessment on how the innovation could impact the commercial balance of existing investments and commercial commitments made by parties (Gencos, transporter, gas importers and others) across the energy value chain. These commitments are necessary to underpin energy security and reliability.</p>	<p>EMA notes the comment. Any permanent changes to existing regulations will be made after an industry consultation process.</p>
<i>GreenSync</i>	
<p>The EMA notes that a regulatory Sandbox may not be suitable under the following circumstances:</p> <ul style="list-style-type: none"> a. The solution is considered to be similar to those that are already being offered in Singapore (i.e. no element of innovation or experimentation); b. The Applicant has not done its due diligence to test and verify the viability and safety of the solution, such as testing the solution in a laboratory environment, and obtaining the necessary technical and safety certifications for the product or technology used in the c. experimentation; or 	

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<p>d. The Applicant can reasonably and effectively experiment with the solution in a laboratory or test environment, such as in an ongoing R&D test-bed.</p> <p>We encourage the EMA to take a broader interpretation to the first of these circumstances. There may be a number of providers currently offering innovation solutions into the Singaporean market who are operating without the benefit of the regulatory sandbox. However, they may have made compromises in how they have developed and implemented their solutions. We note that in OFGEM’s update to the sandbox invitation, there are two peer-to-peer energy trading schemes. OFGEM has accepted these proposals despite peer-to-peer trading already being trialled in the UK and across a number of global energy markets.</p>	<p>EMA has amended the Framework to provide further clarity and flexibility: The key is articulating the learning value and opportunity that would be tested with the project. e.g. proposed solution would not be considered “similar” if a different technology is applied, or the same technology is applied differently.</p>
<p><i>LYS Energy Group</i></p>	
<p>Referring to the clause 5.6(a) of the consultation paper, the evaluation of a “solution considered to be similar to those that are already being offered in Singapore” sounds subjective: sometimes, a new service, which is an improvement or optimization of an existing service, is successfully adopted by the customers and therefore it should not be dismissed. An alternative to an existing solution that is constrained by a patent should also not be dismissed, even though it provides a similar service, but in a more open manner.</p>	<p>EMA has amended the Framework to provide further clarity and flexibility: The key is articulating the learning value and opportunity that would be tested with the project. e.g. proposed solution would not be considered “similar” if a different technology is applied, or the same technology is applied differently.</p>
<p>Referring to clause 5.6(b), the applicant faces a risk of deploying much effort to get all necessary certifications, and the corresponding financial resources, with an uncertain outcome since his solution could be dismissed. It would be useful that the</p>	<p>EMA will evaluate such situations on a case-by-case basis. While we understand that Applicants may incur costs when submitting a proposal, EMA would also have to consider the</p>

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solutions get “tested” within the Sandbox experiment prior to incurring all the costs.	risks that may arise if the Applicant has not obtained the necessary technical and safety certifications.
Mr Ng Soo Yong (Provided as independent feedback)	
Define ‘Similar’. If a different technology is applied or the same technology is being applied differently, it should not be similar.	EMA has amended the Framework to provide further clarity and flexibility: The key is articulating the learning value and opportunity that would be tested with the project. e.g. proposed solution would not be considered “similar” if a different technology is applied, or the same technology is applied differently.
Do the applicants need to have a minimum viable product (MVP) or comprehensive solutions to take part or is he allowed to build the solutions within stipulated dateline?	There is no such requirement. Applicants can submit their proposals to EMA for evaluation. Based on its assessment, EMA can help to facilitate link-ups with other ongoing initiatives (e.g. R&D grant calls), if necessary.
Red Dot Power Pte Ltd	
The Objectives and Principles of the Sandbox are well thought of.	EMA notes the comment.
SembCorp Industries Ltd	
Technologies chosen/used in the Sandbox could affect the competitiveness of the market.	EMA notes the comment.
There are negative social/non-commercial implications associated with the project that are not to Singapore’s benefit.	EMA notes the comment.
For this section, EMA could include the purpose and key objectives so that the restriction can be better managed. Example of topics	EMA welcomes proposals for innovative energy solutions or services to ensure a reliable and secure energy supply,

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could include energy efficiency, risk mitigation, new business model, supply resilience, carbon footprint, lower electricity price etc.	promote effective competition in the market and develop a dynamic and sustainable energy sector in Singapore.
<i>Singapore LNG Corporation Pte Ltd</i>	
The Sandbox may not be suitable for products or services that may pose danger to safety or reliability of the gas and electricity supply. Other than this, we view that EMA should not be overly prescriptive in defining the criteria for the Sandbox.	EMA notes the comment.
<i>Sun Electric Pte Ltd</i>	
You may want to add that the Sandbox should be limited to items which have a relevant commercial benefit (relevant benefit) to the market such that they be economical to test. E.g. Some innovation may have technical merit, but insignificant financial benefit to consumers. Some may have advanced technical features but be harder to use, and extremely unlikely to be induced by any customer. This avoids market based testing for the benefit of scientific inquiry, where the Universities would be the proper venue to test technology which has a meaningless effect in a functioning marketplace.	EMA will not limit the scope of proposals, so long as they meet the requirements of the evaluation criteria.
You may want to extend the sandboxing toward innovation that is NOT risky to implement, and is difficult to implement from a political or commercial circumstance. Eg. MSSL is potentially required to install a meter but don't feel like doing is because they are too busy. This assists innovation in progressing where non-competitive market elements fall into monopolies :(Specific example: innovative blockchain company wants to obtain market company	EMA notes the comment.

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<p>(MC) license to eliminate Clearance fees at the cost of a single server and some cryptographic keys - clearly benefiting all consumers by dropping the cost of USEP/kWh. Innovator testing means they first need to go through EMC, the only MC- who is their direct competitor and would likely react to slow down the competitors entry to obtain said market company license).</p>	
<p><i>Sunseap Group</i></p>	
<p>Given that much is deemed on a case-by-case basis subjected to EMA’s discretion, the criteria are not restrictive as it provides the company with an open-ended basis to work from.</p>	<p>EMA notes the comment.</p>
<p><i>Tuaspring Pte Ltd</i></p>	
<p>Is there any limit to the duration for a Sandbox to be applied? Section 5 doesn't seem to prescribe a maximum duration applicable for a Sandbox. A prolonged Sandbox, could unduly undermine recovery of market or system charges which are based on consumption or generation, and potentially “subsidized” by other licensees.</p>	<p>Duration of sandboxes will be assessed on a case-by-case basis, based on factors such as the scope and complexity of projects.</p>

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Q3. Is the proposed evaluation criteria comprehensive to assess the proposal’s suitability for a Sandbox?

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<i>Energy Market Company Pte Ltd</i>	
<p>In assessing the suitability of the proposal or circumstances for a Sandbox, other than identifying the benefits and defining the conditions/boundaries, costs, such as (1) that incurred by service providers to create the Sandbox and (2) market impact arising from the Sandbox, should also be factored in.</p> <p>(1) Costs could potentially be incurred by service providers arising from system changes, alternative arrangements and consultation services required for the Sandbox. EMA must also allow the service providers including EMC to recover any additional costs incurred.</p> <p>(2) Market impact could stem from market distortion, such as disruption in the revenue neutrality of service providers arising from differential treatment in the settlement of facilities in the Sandbox.</p> <p>Cost-benefit analyses should be done for a more informed decision to be made by the EMA or Applicant (depending on whether the market or Applicant bears the costs) to embark on the Sandbox.</p>	<p>EMA is of the view that such circumstances should be assessed on a case-by-case basis. EMA will carefully assess the impact/risks of the Sandbox prior to approving it for experimentation.</p>
<i>EDF Lab Singapore</i>	
<p>The evaluation criteria is comprehensive, but can be improved to encourage innovation.</p>	<p>EMA notes the comment.</p>
<p>The criteria states there must be a benefit to consumers and/or the power sector. In this context, there is a lack of clarity on how EMA rates the risks and the value-add to consumers versus the industry.</p>	<p>EMA will allow the sandbox to proceed as long as the proposal meets the requirements of the evaluation criteria. These</p>

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	include the setting of boundary conditions and risk-mitigating measures to reduce the risks to consumers and the industry.
It requires Applicant to have secured the necessary resources for the sandbox. However, it is unclear if EMA allows the Applicant to form a consortium, or how open it is to the Applicant achieving the resources through external grants or funding. For instance, if residential consumers are the target segment, HDB and Town Councils would need to be partners for the trial.	As stated in para 8.2(d) of the Framework, the proposal should show that the Applicant has secured or intends to secure relevant assets and resources for experimentation. EMA is open if the financial resources are obtained through external grants or funding. EMA has rephrased “an interested firm” as “an interested party/parties” to make it clearer that i) we are not limiting applications to those from the private sector only; and ii) that we are not limiting applications to single entities only.
The reporting to EMA must be balanced against the operations of the trial, to reduce reporting fatigue and avoid neglect on actual implementation.	Reporting schedules will be discussed and agreed upon between EMA and the Applicant prior to the start of the sandbox trial.
<i>ExxonMobil Asia Pacific Pte Ltd</i>	
There should be a mechanism for periodic sharing on sandbox developments with the stakeholders or market participants	EMA notes the comment. EMA is prepared to share updates subject to meeting confidentiality requirements.
Some Sandbox could be reviewed by change management bodies with industry representations for comprehensive feedback (e.g. similar to RCP setup concept). However, it should be scaled down version of the RCP to ensure nimbleness.	Due to reasons of confidentiality and potential conflicts of interests, EMA will assess and evaluate proposals via an internal panel.
To consider a defined minimum and maximum time frame or size for an activity in the sandbox.	Duration of sandboxes will be assessed on a case-by-case basis, based on factors such as the scope and complexity of projects.

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<i>Gas Supply Pte Ltd & Pavilion Gas Pte Ltd</i>	
<p>While the evaluation criteria is reasonably comprehensive and can be further refined, we suggest that EMA consider forming an Advisory Panel to support the evaluation. The panel should have a blend of industry veterans and innovators who could provide additional perspectives on the viability and impact of such innovation and the Sandbox parameters. The advisory panel can be further consulted on extension or exit options.</p>	<p>Due to reasons of confidentiality and potential conflicts of interests, EMA will assess and evaluate proposals via an internal panel.</p>
<i>GreenSync</i>	
<p>We support these criteria and offer the following on each:</p>	
<p>Genuine innovation – As with our previous comments on the circumstances where a regulatory sandbox might not be appropriate we ask that the EMA take a broad interpretation to the definition of genuine innovation. Battery storage is an old technology however communication improvement, as well the declining cost of production, make sure that its wide-scale use in the energy sector can be considered innovative.</p>	<p>Clarity has been added in the guidelines to place more emphasis on how technology is applied in delivering the proposed service, and that secondary research should show that few or no comparable offerings are available in the Singapore market.</p>
<p>Benefit to consumers and/or the power sector – With most technological advancements the benefits are never known with perfect foresight. We ask that an applicant provide high level information on expected benefits and not be required to quantify</p>	<p>EMA notes the comment. Applicants are required to state the benefits of the product/service to consumers and/or the gas and electricity sectors in the proposal. EMA will monitor and</p>

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the potential benefits. Further, these expected benefits should not be used by the EMA to decide whether the trial is proceeding appropriately or whether it should be discontinued.	determine whether to continue or terminate the project during the experimental stage, as stated in the Framework.
Need for Sandbox – We believe that this should also cover interpretation uncertainty where following discussions between the applicant and the EMA it is still unclear whether the existing regulations provisions permit the new technology to be deployed in a manner which is compliant.	EMA notes the comment.
Ready for testing – We support the intent of this criteria.	EMA notes the comment.
Defined boundary conditions - We support the intent of this criteria.	EMA notes the comment.
Defined monitoring and evaluation procedure – As noted in response to question 2 we support a more frequent reporting program and request that this be included.	EMA notes the comment. The reporting schedule will be discussed and agreed upon by EMA and the Applicant during the evaluation stage.
Risk assessment and mitigation - We support the intent of this criteria.	EMA notes the comment.
Defined exit conditions – We believe that this could be expanded to include extensions to the sandbox.	EMA has amended the Framework to require applicants to consider project extensions in their defined exit and transition conditions.
<i>LYS Energy Group</i>	
The criteria are comprehensive enough and cover the necessary aspects of the project.	EMA notes the comment.

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<p>Risk lies with the outside experts (consulting firms) that could be mandated to evaluate some elements of the proposal. How to strictly protect IP and rights to innovation?</p>	<p>Due to reasons of confidentiality and potential conflicts of interests, EMA will assess and evaluate proposals via an internal panel. EMA can help to facilitate the necessary link-ups to stakeholders (e.g. IPOS) on IP- and patent-related issues.</p>
<p><i>Mr Ng Soo Yong (Provided as independent feedback)</i></p>	
<p>The criteria list should be non-exhaustive with the panel evaluating the business plan from diverse background such as exploit technologies agency, energy entrepreneurs, energy venture capitalist, utility market participants, regulators.</p>	<p>Due to reasons of confidentiality and potential conflicts of interests, EMA will assess and evaluate proposals via an internal panel.</p>
<p>Does the Applicant really need to have a minimum viable product (MVP) or comprehensive solutions to take part or is he allowed to build the solutions within a stipulated dateline?</p>	<p>There is no such requirement. Applicants can submit their proposals to EMA for assessment based on the Sandbox evaluation criteria. Based on its assessment, EMA can help to facilitate link-ups with other ongoing initiatives (e.g. R&D grant calls), if necessary.</p>
<p><i>PacificLight Power Pte Ltd</i></p>	
<p>Para 6.2 (e): (Defined Boundary Conditions) PLP would also recommend that Sandbox Projects are set-up in a physically defined premise such as education institute, industry park, etc. This is to ensure that any disturbance to the market is controlled, measured for comprehensive analysis and kept to the minimum.</p>	<p>EMA notes the comment. This will depend on specific project details. EMA will discuss with the applicant on the necessary safeguards required to ensure safety to the public and the energy sector.</p>

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<p>Para 6.2 (g): (Risk Assessment and Mitigation) The paper requires the applicant to identify significant risks arising from the proposed technology/service. To ensure adequate safety planning are laid out, PLP would recommend that application should also require applicant to detail out any tests it plans to implement as well as corresponding risk assessment for each test.</p>	<p>Applicants are required to submit their monitoring and evaluation plans, as well as related technical/safety reports prior to the commencement of the sandbox trials.</p>
<p><i>SembCorp Industries Ltd</i></p>	
<p>Long-term benefits could be considered instead of considering the competitiveness in long term.</p>	<p>EMA notes the comment. EMA welcomes proposals for innovative energy solutions or services to ensure a reliable and secure energy supply, promote effective competition in the market and develop a dynamic energy sector in Singapore.</p>
<p>Deliverables in each milestone and reporting period should be clearly indicated/ defined.</p>	<p>EMA notes the comment. Deliverables and the reporting schedule will be discussed and agreed upon by EMA and the Applicant during the evaluation stage.</p>
<p>Proposed evaluation criteria could include technologies that have no existing policy or framework yet.</p>	<p>EMA notes the comment. This is part of the objectives of the sandbox framework.</p>
<p>Applicant financial status should be evaluated if the applicant can afford to overcome the risk even with mitigation plans.</p>	<p>EMA notes the comment. Applicants are expected to submit details of its financial standing as stated in para 8.2(c) in Annex A of the consultation paper.</p>
<p>What is the scale of potential benefit to consumers and the industry – clearly, ideas with higher potential benefits will be more attractive than ideas with less potential benefits.</p>	<p>Projects will be evaluated on a case-by-case basis. EMA welcomes proposals for innovative energy solutions or services to ensure a reliable and secure energy supply,</p>

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	promote effective competition in the market and develop a dynamic and sustainable energy sector in Singapore.
<i>Singapore LNG Corporation Pte Ltd</i>	
As a general principle, EMA should not be overly prescriptive in setting qualifying criteria for the Sandbox if EMA wishes to promote innovation.	EMA notes the comment.
<i>Sunseap Group</i>	
The criteria are comprehensive enough given the limitation of the high risks being associated with the project. It is up to the company to provide relevant supporting details in order for EMA to judge fairly on the sustainability of the proposal.	EMA notes the comment.
<i>Tuas Power</i>	
Para 6.2 (e): (Defined boundary conditions) It is proposed that the Applicant offering innovative energy solutions should clearly inform customers that it is operating in the Sandbox and disclose the key risks associated with the product or service, such as non-delivery or underperformance of a product and service. Customers to acknowledge that they have read and understood the risks.	As stated in the Framework, Applicants are required to obtain the customers’ acknowledgement that they have read and understood these risks.
<i>PUB, Singapore’s National Water Agency</i>	
Para 6.2: The criteria on benefits should not just focus on consumers and/or the power sector, but to Singapore in general.	EMA notes the comment.

Q4. Is the process for extending and exiting the sandbox comprehensive and robust?

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<i>EDF Lab Singapore</i>	
Yes, the process is robust.	EMA notes the comment.
<i>Energy Market Company Pte Ltd</i>	
<p>Para 7.2: We foresee that lead time could be required to change legal or regulatory requirements for the broader deployment of certain products or services. In the interim between the expiration of the Sandbox and effective date of legal or regulatory requirement changes, can EMA clarify on how the Applicant will be regulated? This is because if extension is granted to the Applicant in the interim, the Applicant could enjoy significant first mover advantage i.e. able to acquire market power in a protected environment with no competition while waiting for regulatory changes. On the other hand, if no extension is granted to the Applicant in the interim, this could deter potential future Applicants as they have to remain idle/ unproductive in the interim. We suggest that the EMA consider the costs and benefits in selecting an appropriate arrangement for the Applicant during the interim.</p>	<p>The sandbox is typically discontinued if the Applicant is unable to fully comply with the relevant legal and regulatory requirements at the end of the sandbox period. The Applicant should be aware of its inability to meet certain legal and regulatory requirements when submitting the sandbox application, and has the responsibility to ensure that there is a plan in place to meet these requirements.</p> <p>The Applicant is encouraged to engage EMA early if it anticipates that it cannot comply with the legal and regulatory requirements upon exiting the sandbox and can apply to EMA for an extension of the sandbox period if it helps the sandbox entity to fully comply with the relevant legal and regulatory requirements subsequently. EMA will assess such situations on a case-by-case basis in the interest of encouraging innovation in the energy sector, protecting consumers and maintaining a level-playing field.</p>
<p>Para 7.5: Fixed assets can be disconnected but need not be decommissioned as long as they do not violate any existing legal or regulatory requirement.</p>	<p>EMA notes the comment. Applicants are to state how they intend to handle the fixed assets as part of the exit conditions.</p>
<i>ExxonMobil Asia Pacific Pte Ltd</i>	

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Ensure that the market does not inadvertently shoulder risks associated with sandbox activities.	EMA notes the comment.
EMA to consider assistance with patent or prevention of plagiarism.	EMA notes the comment.
Re clause 7.4 (d), ability for applicant to exit the Sandbox at its own discretion could be disruptive and believe EMA would consider it with reference to clause 7.5; suggest to reinforce the caveats by referencing the subjectivity.	EMA notes the comment. The Applicant is expected to ensure that any existing obligation to its customers of the product/service under experimentation must be fully fulfilled or addressed.
GreenSync	
The one month proposed extension timeframe pre-supposes that the EMA will be resourced sufficiently to evaluate and respond to the request. Either a longer time period is required or the EMA must be compelled to make a decision within a specified timeframe, say 5 or 10 days. This will provide the technology provider to inform its customers and others affected that it will or will not be able to continue with the trial.	The one-month proposed extension period is the minimum time required for extension requests – Applicants are to inform EMA as early as practically possible, at least one month before the end of the Sandbox period, on such requests.
Keppel Energy	
Para 7.3(b): Can the EMA provide more details on how it will determine the regulatory treatment for Sandbox products/services that have successfully achieved the intended test outcomes? As with the proposed approach for the evaluation and selection of Sandbox Projects, will there also be a formal procedure for the amendment of the existing regulatory framework to accommodate such successful Sandbox Projects for broader deployment? It	The sandbox is typically discontinued if the Applicant is unable to fully comply with the relevant legal and regulatory requirements at the end of the sandbox period. The Applicant should be aware of its inability to meet certain legal and regulatory requirements when submitting the sandbox application, and has the responsibility to ensure that there is a plan in place to meet these requirements.

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<p>would be helpful if more clarity can be provided on the project phase subsequent to exiting the Sandbox.</p>	<p>The Applicant is encouraged to engage EMA early if it anticipates that it cannot comply with the legal and regulatory requirements upon exiting the sandbox and can apply to EMA for an extension of the sandbox period if it helps the sandbox entity to fully comply with the relevant legal and regulatory requirements subsequently. EMA will assess such situations on a case-by-case basis in the interest of encouraging innovation in the energy sector, protecting consumers and maintaining a level-playing field.</p>
<p><i>LYS Energy Group</i></p>	
<p>Yes.</p>	<p>EMA notes the comment.</p>
<p><i>Mr Ng Soo Yong (Provided as independent feedback)</i></p>	
<p>Should sandbox entity not be allowed to proceed if it can’t fully comply with the relevant legal and regulatory requirements? Are these relevant legal and regulatory requirements the “tweak or new” regulatory framework or the existing status quo framework.</p>	<p>The sandbox is typically discontinued if the Applicant is unable to fully comply with the relevant legal and regulatory requirements at the end of the sandbox period. The Applicant should be aware of its inability to meet certain legal and regulatory requirements when submitting the sandbox application, and has the responsibility to ensure that there is a plan in place to meet these requirements.</p> <p>The Applicant is encouraged to engage EMA early if it anticipates that it cannot comply with the legal and regulatory requirements upon exiting the sandbox and can apply to EMA for an extension of the sandbox period if it helps the sandbox entity to fully comply with the relevant legal and regulatory requirements subsequently. EMA will assess such situations on a case-by-case basis in the interest of encouraging</p>

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	innovation in the energy sector, protecting consumers and maintaining a level-playing field.
<i>SembCorp Industries Ltd</i>	
EMA could consider if the extension period could be limited to only a specific timeframe (with respect to the total project timeline).	EMA notes the comment.
Any negative consequences of the experiment must be made good by the Applicant.	EMA notes the comment.
<i>Singapore LNG Corporation Pte Ltd</i>	
<p>Businesses require clarity on the duration of the Sandbox as they will have a certain holding cost. Hence should there be a request from an Applicant for an extension of the Sandbox period, it is critical that a decision be conveyed to the Applicant as soon as possible. In this regard, setting a timeframe for which EMA will target to respond to the Applicant will be useful.</p> <p>Similarly, if EMA requires an Applicant to exit the Sandbox prior to the expiry date, sufficient notice should be provided, e.g. at least 1 month before the exit date.</p>	<p>The sandbox is typically discontinued if the Applicant is unable to fully comply with the relevant legal and regulatory requirements at the end of the sandbox period. The Applicant should be aware of its inability to meet certain legal and regulatory requirements when submitting the sandbox application, and has the responsibility to ensure that there is a plan in place to meet these requirements.</p> <p>The Applicant is encouraged to engage EMA early if it anticipates that it cannot comply with the legal and regulatory requirements upon completion of the sandbox and can apply to EMA for an extension of the sandbox period if it helps the sandbox entity to fully comply with the relevant legal and regulatory requirements subsequently. EMA will assess such situations on a case-by-case basis in the interest of encouraging innovation in the energy sector, protecting consumers and maintaining a level-playing field.</p>

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<i>Sunseap Group</i>	
Yes.	EMA notes the comment.
<i>Tuaspring Pte Ltd</i>	
Prior to implementation of any new regulatory or policy regime for a product/service exiting a Sandbox, we request that EMA seeks industry view through industry consultation process. This is to aid understanding by current licensees.	EMA notes the comment. Any permanent changes to existing regulations will only be made after an industry-consultation process.
<i>YTL PowerSeraya Ptd Ltd</i>	
Consumers/industry opinions should be taken into consideration for the evaluation process.	This may not be tenable due to confidentiality reasons. Nevertheless, EMA will consult the industry before implementing any system-wide changes.
<i>PUB, Singapore’s National Water Agency</i>	
Para 7.3: Should not EMA be the party, rather than the applicant, to review and assess whether broader deployment is possible. This also involves EMA to review the regulatory/legal requirements and whether they can be relaxed upon a larger scale. It would not be fair or sensible to put the onus on the Applicant to conduct the review	Yes. EMA will be the final approving authority.

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Q5. Are there any other circumstances that might require the solution to be discontinued? Is the current criteria too restrictive?

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<i>EDF Lab Singapore</i>	
The current criteria is comprehensive enough.	EMA notes the comment.
<i>Energy Market Company Pte Ltd</i>	
Sandbox period should be reasonably determined as time necessary to experiment and achieve test outcomes. If test outcomes were to be achieved prior to expiration of Sandbox, Sandbox should be discontinued. Further, EMA should set specific boundaries for the Sandbox and monitor them periodically, to prevent Applicants from misusing the Sandbox to gain undue advantage over the rest of the market. For instance, if an Applicant for a 1-year Sandbox were to achieve test outcomes within 3 months, the Applicant could choose not to declare completion of Sandbox and use the remaining 9 months to solicit customers.	Boundary conditions and the defined monitoring and evaluation procedures will be discussed and agreed upon by both EMA and the Applicant prior to the commencement of the trial. Following the achievement of the test outcomes, EMA will concurrently review if there should be any rules changes required and implement these changes after an industry-consultation process. This will ensure a level-playing field for the industry.
<i>ExxonMobil Asia Pacific Pte Ltd</i>	
EMA to consider assistance with patent or prevention of another company plagiarism.	EMA can help to facilitate the necessary link-ups to stakeholders (e.g. IPOS) on IP- and patent-related issues.
<i>GreenSync</i>	
The EMA proposes that the sandbox will be discontinued if one of the following conditions is not met: a. EMA is not satisfied that the Sandbox has achieved its intended purpose, based on the latest test scenarios,	

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<p>expected outcomes and schedule mutually agreed with the Applicant;</p> <ul style="list-style-type: none"> b. a substantial flaw has been discovered in the product/service under experimentation, or if there are any severe unintended consequences, where the risks posed to consumers or the power system outweigh the benefits of the product / service under experimentation, and the Applicant acknowledges that the flaw cannot be resolved within the duration of the Sandbox; c. EMA terminates the Sandbox due to reasons such as the Applicant breaching any condition imposed for the duration of the Sandbox; or d. the Applicant has informed EMA of its decision to exit the Sandbox at its own discretion. <p>We believe that preserving the security and reliability should be paramount during the sandbox trial and that the EMA only discontinue a trial if the security and reliability of the system is being compromised. We therefore do not believe that conditions a or c should be grounds for discontinuation of the sandbox.</p> <p>As we have noted in response to Question 4 on the proposed objectives, the benefits of any trial will not be known with any certainty at the time that the trial is implemented. There may be some minor technical issues which arise through the trial, which mean that the benefits may not be realised as early as thought, or that the trial requires minor modifications. We therefore suggest that if conditions contemplated in condition arise, the trial be allowed to continue until the initially agreed timeframe, unless the applicant decides to exit the sandbox earlier.</p>	<p>EMA disagrees with this statement, as there may be real system costs arising from sandbox that warrants discontinuation of the sandbox. Nevertheless, EMA can set a grace period or specific duration, as agreed by both EMA and the Applicant, by which the Applicant has to correct the technical issue within the set timeframe.</p>

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<p>As we have noted in relation to question 1, that there may be an inadvertent breach of conditions when trialling new technology. We do not believe that condition c should be grounds for discontinuation.</p>	
<p>We support an applicant being able to discontinue the trial.</p>	<p>EMA notes the comment.</p>
<p><i>Keppel Energy</i></p>	
<p>While the proposed Regulatory Sandbox approach will have some safeguards in place to contain the potential consequences of failure (e.g. through well-defined boundary conditions), the testing of new products and services will still involve residual risks, especially when regulations are relaxed.</p> <p>Paragraph 7.5 addresses only the obligations of the Applicant to customers of its product/service under experimentation prior to exiting or discontinuing the Sandbox. However, in the event that a Sandbox results in adverse consequences that affect the general public and/or the power system, how would the impact be dealt with? Any costs arising from such unforeseen flaws in the Sandbox should not be borne by the Industry and the end-users.</p>	<p>EMA will review the situation and make an assessment before deciding on the next course of action. There will be careful deliberation on the risk and potential impact of the experimentation proposed by the Applicant. Any experimentation that takes place must protect the interests of consumers and maintain the safety and robustness of the electricity and gas sectors. In the event of a breach of current regulations, any business-related cost will be borne by the applicant based on the causer-pay principle.</p>
<p><i>LYS Energy Group</i></p>	
<p>The criteria for discontinuation, under clause 7.4(a) can be perceived as subjective, specifically for innovation in services where the outcomes contain a fair part of intangibles. It could prove useful, in this instance, to include market adoption as a criteria.</p>	<p>EMA disagrees – Market adoption should be not a factor in evaluating the continuation of projects as the product / solution could have potential benefits to the electricity and gas sectors in the long term.</p>
<p>Other clauses make sense.</p>	<p>EMA notes the comment.</p>

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<i>Mr Ng Soo Yong (Provided as independent feedback)</i>	
Under what sort of circumstances can the sandbox duration be prolonged further? It is always easier to debug the flaws rather than to terminate it and restart again.	As the nature of proposals may vary, EMA will assess this on a case-by-case basis, depending on the justifications presented by the Applicant. The Applicant is encouraged to consult EMA as early as practicable on the possibility of any extension, and to provide reasons to support the application for extension.
<i>Red Dot Power Pte Ltd</i>	
The currently laid down circumstances / criteria are comprehensive enough that underlines the basic requirement of security and safety aspects.	EMA notes the comment.
<i>SembCorp Industries Ltd</i>	
Company status such as financial status and M&A transaction may disrupt the sandbox process. Early warning system could be set up and regular dialogues can be initiated to detect problems in early stage.	EMA notes the comment.
Unwanted social or political issues may cause disruptions to the Sandbox.	EMA notes the comment.
Violation of rules and regulations and maintaining of the criteria have to be monitored.	EMA notes the comment.
<i>Singapore LNG Corporation Pte Ltd</i>	

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Respondents’ Feedback	EMA’s Responses
<p>Terms for discontinuation of the Sandbox should be stated upfront by EMA before the Applicant’s entry into the Sandbox. The terms should also be objective, clear and specific to prevent any ambiguity that could lead to disputes on interpretations of the terms.</p>	<p>EMA notes the comment. This will be discussed and agreed upon by both EMA and the Applicant during the evaluation stage.</p>
<p>Clause 7.4 (a) indicates a potential justification for EMA to discontinue the Sandbox is that “EMA is not satisfied that the Sandbox has achieved its intended purpose...”, which can be very subjective unless there is a specific criteria which EMA can use to assess the progress or status of the Sandbox.</p>	<p>The objectives and boundary conditions will be discussed and agreed upon by both EMA and the Applicant during the evaluation stage.</p>
<p><i>Sunseap Group</i></p>	
<p>Referring to section 7.4, should EMA be not satisfied because of latest test scenarios/results and how they differ from expected outcomes, the applicant/sandbox owner should be given the option to take corrective and preventive action to resolve the differences, within a certain rectification period.</p> <p>This rectification period shall propose by the applicant, together with documents supporting the justification of the rectification period, perhaps a timeline on how the unexpected outcome can be resolved and a root cause analysis of an unexpected outcome. The rectification period shall also be mutually agreed. Failure to justify the rectification period would then result in the sandbox termination.</p>	<p>EMA and the Applicant can set a grace period or specific duration, by which the Applicant has to correct the technical issue within the set timeframe.</p>
<p><i>Tuaspring Pte Ltd</i></p>	

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<p>Apart from the 4 circumstances proposed in Section 7.4, we feel that EMA should consider discontinuing a Sandbox if there are substantial number of licensees who object to such Sandbox with substantiated reasons and evidence of an experiment in Sandbox having negatively impacted system stability or having unfair advantage to the Applicants’ consumers.</p>	<p>EMA disagrees to automatically discontinue the sandbox in such a circumstance. Nevertheless, EMA will hear licensees’ views before making a decision.</p>
<p><i>YTL PowerSeraya Ptd Ltd</i></p>	
<p>The solution should be discontinued if there is negative impact on consumers/industry (with such negative impact verified by the relevant authorities) unless such negative impact can be adequately addressed such as through compensation.</p>	<p>EMA notes the comment.</p>
<p><i>PUB, Singapore’s National Water Agency</i></p>	
<p>Para 7.5: The application “should” ensure.... Is too mild a word. “Must” might be more appropriate, to fully protect the rights and welfare of the customers.</p>	<p>EMA notes the comment. To provide clarity, the sentence has been rephrased as “The Applicant <u>shall</u> ensure that any existing obligation to its customers of the product / service under experimentation must be fully fulfilled or addressed.”</p>

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Q6. Is the proposed application and approval process comprehensive and robust?

Respondents’ Feedback	EMA’s Responses
<i>Dr Victor Wong (Provided as independent feedback)</i>	
Following implementation of the project, does EMA propose to continue monitoring the project?	Yes. Reporting schedules will be discussed and agreed upon between EMA and the Applicant prior to the start of the sandbox trial.
How does EMA deal with a change in the business model for the specific innovation? The Applicant (private sector) agenda is to be profitable and will create various business models around the innovation.	Any change requests are to be submitted to EMA as part of the evaluation stage. EMA will assess and evaluate on a case-by-case basis.
<i>EDF Lab Singapore</i>	
Yes, the proposed process is robust. It is also good to have an officer assigned to expedite the process.	EMA notes the comment.
<i>Energy Market Company Pte Ltd</i>	
To streamline the application and approval process, we suggest that EMA first define its objectives for the Sandbox and identify a few themes or buckets e.g. distributed energy resources (including renewables and energy storage), demand-side initiatives (including energy efficiency), electric vehicles, smart grid management, etc. Also, we propose EMA stipulate window periods for submissions relevant to each defined theme/bucket, instead of accepting ad-hoc submissions. This is to allow for the EMA to better evaluate Applicants with similar proposals based on predefined metrics such as the amount of resources (funding or expertise) available to the Applicants, instead of a first-come-first-	EMA does not intend to limit the types of proposals for submissions. EMA welcomes proposals for innovative energy solutions or services to ensure a reliable and secure energy supply, promote effective competition in the market and develop a dynamic energy sector in Singapore. EMA is also not limiting applications to single entities only – interested applicants can form consortiums to apply for a Sandbox if it is deemed beneficial to the parties involved.

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<p>served basis when submissions are ad-hoc. In addition, the EMA can approve one or more Applicants with similar proposals for the same Sandbox to reap economies of scale. Such Applicants can share the fixed costs incurred by service providers or other costs for the same Sandbox.</p>	
<p>At the Evaluation Stage, EMA should consult, where necessary, service providers to assess the feasibility and estimate the cost and effort of relaxing the relevant legal or regulatory requirements.</p>	<p>EMA notes the comment.</p>
<p>The relevant information of all approved Sandbox applications to be published on EMA’s website should include the legal or regulatory requirement(s) that the approved Applicants are exempted from.</p>	<p>As stated in the Framework, for the purpose of transparency and provision of information to customers, relevant information of all approved Sandbox applications such as the name of the Applicant, the start and expiry dates of the Sandbox experimentation and a broad description of the Sandbox will be published on EMA’s website. For confidentiality reasons, EMA will not share on its website any additional information over and above these requirements.</p>
<p><i>ExxonMobil Asia Pacific Pte Ltd</i></p>	
<p>Suggest for online submission option to be available.</p>	<p>EMA notes the comment. Applications are to be submitted to sandbox@ema.gov.sg.</p>
<p>How often is the application process and announcement windows for submission, or is it an ongoing application?</p>	<p>The initiative is an ongoing process.</p>
<p>Could EMA evaluate within 30 calendar days as it is a good turnaround time to encourage participation.</p>	<p>EMA notes the comment. As stated in the Framework, EMA will endeavour to review the application and endeavour to inform the Applicant of its potential suitability for a Sandbox</p>

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	within 30 working days after EMA receives a complete set of information necessary for the assessment.
Please consider if the “Genuine Innovation” requirement – too restrictive?	EMA has amended the Framework to provide further clarity and flexibility: The proposed solution would not be considered “similar” if a different technology is applied, or the same technology is applied differently.
Could just a change in regulation which allows an existing practice to be changed be proposed? Maybe as a path to more quickly change a regulation.	Any changes to regulations have to be balanced against potential risks to the power sector. The Sandbox allows opportunities to evaluate the pros and cons of introducing such technologies and solutions on a broader scale.
GreenSync	
We broadly support the proposed application and approval process. We note that the EMA has imposed timeframes and obligations on the applicant but has not been explicit on its own timeframes to assess, respond or approve to applications. We propose that the EMA be more explicit about its own timeframes.	EMA notes the comment. As stated in the Framework, EMA shall review the application and endeavour to inform the Applicant of its potential suitability for a Sandbox within 30 working days after EMA receives a complete set of information necessary for the assessment. The start date of the sandbox will be dependent on what changes are required before the sandbox can commence.
LYS Energy Group	
Clause 8.2.g is, in our opinion, inappropriate: transparency is not a necessity at the stage where the innovation is under review. There is no need, and no reason to share with entire industry (including the applicant’s competitors) information related the proposed innovation.	As stated in the Framework, for the purpose of transparency and provision of information to customers, relevant information of all approved Sandbox applications such as the name of the Applicant, the start and expiry dates of the Sandbox experimentation and a broad description of the Sandbox will be published on EMA’s website. For

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<p>a. This clause could refrain willing participants from submitting an offer in order to protect their innovation.</p> <p>b. Whilst the Sandbox initiative is a positive step for the industry to collaborate with the Regulator, it shall preserve innovators edge by protecting information until it is ready to market.</p>	<p>confidentiality reasons, EMA will not share on its website any additional information over and above these requirements.</p>
<p><i>Mr Ng Soo Yong (Provided as independent feedback)</i></p>	
<p>Looks OK but take note of the sensitivity of the information that is published as some are proprietary. Failure in Singapore’s market does not equate that it will fail in other markets.</p>	<p>EMA notes the comment.</p>
<p><i>SembCorp Industries Ltd</i></p>	
<p>Applicant must be clear on the regulations to be modified or waived and give good reasons for their waiver or modification.</p>	<p>EMA notes the comment.</p>
<p><i>Singapore LNG Corporation Pte Ltd</i></p>	
<p>SLNG views that the proposed application and approval process is comprehensive and robust.</p>	<p>EMA notes the comment.</p>
<p><i>Sun Electric Pte Ltd</i></p>	
<p>It should be paramount that sand-boxing is not used where technologies have little reason not to be implemented in the market due to mere commercial circumstances, i.e. as mere posturing that innovation needs to be "tested" for merit when only a monopolised licensee is standing in the way of an otherwise riskless and technically superior implementation. This would only skew</p>	<p>EMA notes that the intention of the Sandbox is to help support innovation and risk-taking that could bring benefits to the market and consumers, by creating an experiment within which the consequences of failure can be contained. Hence EMA does not see a need to automatically reject sandbox proposals for matters related to “market rules, market forces,</p>

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<p>competition future, decreasing innovative risk taking and imposing longer delays in market entry. As such, qualifying criteria importantly must be based on material - technical risks, and not in respect of market rules, market forces, licensees’ interactions, or what boil down to reasons which are competitive in nature, rather than technical in nature.</p>	<p>licensees’ interactions, or reasons which are competitive in nature”.</p>
<p><i>Sunseap Group</i></p>	
<p>Yes.</p>	<p>EMA notes the comment.</p>
<p><i>PUB, Singapore’s National Water Agency</i></p>	
<p>Para 8.2(d): Unclear what is considered a “new” and separate application, and what should be considered a “reapplication”.</p>	<p>As stated in para 8.2(d), the Applicant will be informed of the reasons if the application is rejected. The reasons for rejection could include failure to meet the objective and principles of the Sandbox or any of the evaluation criteria. The Applicant may re-apply for the Sandbox when it is ready to meet the objective, principles and evaluation criteria of the Sandbox.</p>

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Q7. What are some of the possible changes to be made to current regulations that would expand EMA’s ability to provide temporary exemptions to facilitate Sandbox Projects?

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<i>EDF Lab Singapore</i>	
For the sandbox, besides the exemptions, an additional area of consideration may be how the sandbox could potentially involve other agencies in certain targets segments (i.e. commercial consumers – BCA and JTC, residential consumers – HDB).	EMA appreciates the suggestions and acknowledges that there is a wide range of support that can complement the regulatory support provided in a sandbox. Applicants can continue to engage EMA to discuss the relevant areas of potential support for EMA to explore.
<i>Energy Market Company Pte Ltd</i>	
If exemptions from any provision in the Market Rules were to be required to facilitate a Sandbox Project, how does the EMA intend to effect such exemptions?	EMA will work together with the Energy Market Company Ltd (EMC) – the administrator of the Electricity Market Rules – to modify the existing Electricity Market Rules, if necessary, to facilitate Sandbox projects.
Furthermore, exemptions from provisions under the codes of practices, licences or the Electricity Act should not place system security or market integrity at risk, and should only be provided by EMA after consultation with the relevant service providers on a case-by-case basis.	EMA notes the comment.
<i>LYS Energy Group</i>	
Seems appropriate at this point.	EMA notes the comment.
<i>Mr Ng Soo Yong (Provided as independent feedback)</i>	

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<p>Very much depends on the problems the solutions are attempting to solve and how would relaxation of existing regulation helps. E.g. A consumer site can buy electricity in strips of different time tier from different retailer.</p>	<p>EMA notes the comment.</p>
<p><i>Red Dot Power Pte Ltd</i></p>	
<p>RDP is currently engaged with EMA/EMC on issues related to penalty regime for Demand Response related activities. The current regulatory regime is one of the big deterrent to the large-scale deployment of load side facilities in the DR program. This is an ongoing matter, may not necessarily fit into the Sandbox projects.</p> <p>Other project could be micro-grid and nano-grid projects in the Urban environment like Singapore for HDB estates/industrial parks etc. where localized generation and consumption is optimized by deploying on-site generation and storage solutions.</p>	<p>EMA notes the comment.</p>
<p><i>SembCorp Industries Ltd</i></p>	
<p>EMA may wish to consider building in the ability for it to provide exemptions if there is a new set of gas market rules associated with the Secondary Gas market.</p>	<p>EMA notes the comment.</p>
<p><i>Singapore LNG Corporation Pte Ltd</i></p>	
<p>Similar to the Electricity Market Rules, EMA may wish to consider working together with the Gas Transporter to modify or make</p>	<p>EMA notes the comment.</p>

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exemptions for the Gas Network Code on proposals relating to the gas industry.	
<i>Sun Electric Pte Ltd</i>	
We caution against blurring of legal or competitive items with technical innovation or consumer risk. Clear distinctions should be made to address elements of real risk (implementation, technical systems, communications, feasible result of product, consumer adoption or satisfaction), vs. regulatory change and competition. This can be defined in the sand-boxing rules.	EMA notes the comment.
<i>Sunseap Group</i>	
Refer to Question 1.	EMA notes the comment.
<i>Tuas Power</i>	
While the regulatory Sandbox framework seeks to encourage innovation, exemptions of the Applicant from regulatory and legal requirements during and after the end of the Sandbox period should be minimised or avoided to protect consumers and maintain a level playing field in the industry. Furthermore, any changes in rules, legislation etc. (especially if permanent) should be implemented only after extensive consultation with industry to ensure that concerns including issues relating to level playing field, are adequately addressed.	EMA notes the comment.

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<p>The Applicant should have the responsibility to ensure there is a plan in place to meet the relevant regulatory and legal requirements by the end of the Sandbox period. If any, proposal of rule change should go through the Rule Change Panel (RCP) or work with EMA if it involves amendments to the Electricity and Gas Acts. Otherwise, the</p> <p>Applicant could request for an extension of the Sandbox period to help them to fully comply with the regulatory and legal requirements.</p>	<p>EMA notes the comment.</p>

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Q8. Additional Comments

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<i>Dr Victor Wong (Provided as independent feedback)</i>	
Para 1.5: This clause suggests that the Sandbox allows for a consultative approach, not just at the feedback stage, but also should be at the evaluation stage for the proposals.	EMA notes the comment.
Some complex tenders require specialist inputs. Innovative proposals which may include business proposals should have industry and private sector representation as they are more familiar with the business environment.	Due to reasons of confidentiality and potential conflicts of interests, EMA will assess and evaluate proposals via an internal panel.
Innovation is by itself is an outside-of-(sand)box approach. The sandbox concept on guidelines should not be overly restrictive.	EMA notes the comment.
<i>EDF Lab Singapore</i>	
<p><u>EDF’s Experience</u></p> <p>EDF participated in UK OFGEM’s first regulatory sandbox earlier in February this year, and is now successful in this application. Discussion have now begun with the consortium led by EDF Energy R&D UK including partners such as Electron, PassivSystems, Repowering London and University College London – trialling a peer-to-peer local energy trading platform. The platform aims to allow residents in urban areas to source their energy from local renewables and trade that energy with their neighbours, increasing self-consumption of low carbon energy and reducing overall energy costs. With the flexibility to buy and sell for all stakeholders in the local energy market, it</p>	EMA notes the comment.

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<p>would see the possibility of multiple suppliers transacting with the household at any one time.</p> <p>The regulatory sandbox allows the consortium to test the platforms and algorithms that EDF is currently developing for a P2P energy market based on blockchain / distributed ledger technology. It is a platform to develop the potential business models which will deliver benefits to the end-consumers in a cost effective way, and to investigate what are the required changes to the electricity market and the potential barriers in the retail and settlement arrangements between different players.</p>	
<p><i>ExxonMobil Asia Pacific Pte Ltd</i></p>	
<p>The framework does not demonstrate EMA’s support for the initial feasibility study which would be helpful to encourage participation. It is not clear for readers how the framework could encourage more innovations.</p>	<p>EMA recognises that the provision of an avenue to allow potential sandbox applicants to engage EMA and seek guidance on relevant regulatory requirements and concerns would be useful, especially to start-ups that have a limited understanding of the existing regulatory regime. It would also help potential applicants to determine the suitability and need for a sandbox and thereby speeding up the assessment by EMA subsequently.</p> <p>Currently, interested parties can already engage EMA for enquiries, clarifications or discussion. EMA continues to encourage interested sandbox applicants to engage EMA through the EMA Policy & Planning Department, or via email (sandbox@ema.gov.sg).</p>
<p><i>PacificLight Power Pte Ltd</i></p>	

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<p>PLP supports the EMA in developing a Regulatory Sandbox to further encourage more experimentation in Singapore’s electricity and gas sectors.</p>	<p>EMA notes the comment.</p>
<p>Applications for Sandbox Projects are recommended to be reviewed by a panel of experts from within the electricity and gas sectors. PLP would also recommend that Applications include a comprehensive proposal which consists of prior detailed research and findings that can support the merits of qualifying for a Regulatory Sandbox.</p>	<p>Due to reasons of confidentiality and potential conflicts of interests, EMA will assess and evaluate proposals via an internal panel.</p>
<p><i>SP Group</i></p>	
<p>SP Groups supports EMA’s initiative to implement a regulatory sandbox. The energy industry is rapidly evolving with advances in technology and the introduction of new business models that have potential to unlock greater benefits for customers. Many of these technologies and business models are new and continue to evolve. As such, the availability of the sandbox will be an important tool to trial and identify the best innovations for Singapore.</p> <p>As the grid operator, SP Group would certainly support EMA for adhering to principles of safety, security, and containment of failure. As it is not possible to define every potential failure or risk, SP Group believes that EMA would prudently assess each application to meet these principles.</p> <p>SP Group concurs with EMA’s main criteria of innovation and benefits to consumers as the basis for approving sandbox initiatives. With the industry evolving so rapidly, innovations can</p>	<p>EMA notes the comment.</p>

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<p>originate from all players, new entrants or existing licensees. We presume EMA would consider all sandbox proposals on the merits of the proposed criteria regardless of its identity. By giving all players an opportunity to serve customers, Singapore will be best positioned to build a robust energy ecosystem.</p> <p>SP Group also recommends that EMA make clear and transparent the nature of each sandbox, the qualifying criteria, and the specific regulation to be relaxed. The transparency would have the effect of encouraging more stakeholders to participate. If a different player seeks to demonstrate the delivery of benefit similar in nature to an approved sandbox, using distinct capabilities and resources, the player should be given the opportunity to conduct its project. After all, consumers should have the opportunity to benefit from all potential sources, not just the “first past the gate”. In the same spirit, existing licensees should be granted equal opportunity to test and demonstrate value of similar nature to an approved sandbox, where the rule to be relaxed could be different than that granted under the approved sandbox, due to its existing license.</p> <p>As a final suggestion, participation in innovation and hence sandboxes, should be on a voluntary basis. Players would each have their priorities, resource considerations, and constraints. Each player, new entrant, or existing licensee, should participate on terms and conditions that meet its considerations.</p>	
<p><i>Sunseap Group</i></p>	

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<p>Page 10, "For the purpose of transparency ... the start and expiry dates of the Sandbox experimentation and a broad description of the Sandbox will be published on EMA’s website." " - Should the description of the Participant’s new initiative be kept confidential to protect the Participants as it is considered as an innovation.</p>	<p>EMA notes the comment. As stated in the Framework, for the purpose of transparency and provision of information to customers, relevant information of all approved Sandbox applications such as the name of the Applicant, the start and expiry dates of the Sandbox experimentation and a broad description of the Sandbox will be published on EMA’s website. For confidentiality reasons, EMA will not share on its website any additional information over and above these requirements.</p>
<p><i>Tuaspring Pte Ltd</i></p>	
<p>Tuaspring supports the Sandbox initiative as a means to support development of innovative technologies and solutions. However, we caution against overly relaxing rules in support of such development works. As participants in a liberalized energy market of Singapore, the potential Applicants have to take into consideration the current situation of the market and prepare a business case based on existing market conditions. In addition, Applicants like all other licencees have to be liable to penalties to avoid actions of wilful misconduct and gross negligence that could potentially be a threat to the system security and stability, or impact recovery of market charges while in their Experimental Stage.</p>	<p>EMA notes the comment.</p>
<p><i>YTL PowerSeraya Ptd Ltd</i></p>	
<p><u>Extension of Regulatory Sandbox to not just testing of innovative products and services but also testing that could be beneficial but is deterred by the existing legal and regulatory requirements</u></p>	<p>EMA notes the comment.</p>

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<p>The idea of the Regulatory Sandbox is to allow for testing of innovative products and services with relaxation of specific legal and regulatory requirements which would not otherwise be tested but which could provide benefits to the market and consumers. This idea should be extended to testing that could provide benefits but may not be innovative but which may not take place without the relaxation of specific legal and regulatory requirements.</p> <p>After major refurbishment/replacement of the fuel changeover system of combined cycle plants, there should be testing done by attempting fuel changeover(s) from natural gas to diesel. However as if the fuel changeover were to fail, the genco would be subject to sanctions under EMA’s “Regulatory Framework to Enhance Fuel Changeover Reliability of Gas-fired Generating Plants”, there is reluctance to do such testing. Such testing would be beneficial as would not have to wait till later when a fuel changeover has to be done in accordance with the regulatory framework whether for regular testing or activation in accordance with operating procedures to discover problems (if any) with the fuel changeover system. Earlier discovery and rectification of such problems would be beneficial for system security. It is also noted that testing of fuel changeover after major refurbishment of the fuel changeover system is part of the commissioning of the fuel changeover system after major refurbishment/replacement. Commissioning generation facilities are not subject to re-testing requirements and penalties for failed fuel changeovers and in the same light, commissioning of the fuel changeover system after major refurbishment/replacement should be afforded the same treatment.</p>	

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<p><u>Transparency of application</u></p> <p>There should be transparency of the application of the Regulatory Sandbox with industry members kept informed of the solutions to which the Regulatory Sandbox is applied. All Regulatory Sandbox projects should be made known to gas or electricity market participants, as they may be directly or indirectly affected by the project outcome and possible future implementation.</p>	<p>As stated in the Framework, relevant information of all approved Sandbox applications such as the name of the Applicant, the start and expiry dates of the Sandbox experimentation and a broad description of the Sandbox will be published on EMA’s website. For confidentiality reasons, the sharing of any additional information will require the Applicant’s agreement.</p>