



ประกาศบริษัท ปตท. จำกัด (มหาชน)

ทะเบียนเลขที่ 0107544000108

เรื่อง แจ้งแก้ไขรายละเอียดการประมูล Hiring of construction small sodium bicarbonate plant

อ้างถึงประกาศบริษัท ปตท. จำกัด(มหาชน) เลขที่ PR 1120018607 เรื่อง Hiring of construction small sodium bicarbonate plant

ดังกล่าวละเอียดแจ้งแล้ว นั้น บริษัท ปตท. จำกัด(มหาชน) มีความจำเป็นต้องเปลี่ยนแปลงกำหนดการประมูลโดยมีรายละเอียด ดังนี้

- การยื่นซอง

กำหนดการ

จากเดิม

• วันที่ 9 มิถุนายน 2566 เวลา 9:00 น. ถึง 15:00 น.

เป็น

• วันที่ 9 สิงหาคม 2566 เวลา 9:00 น. ถึง 15:00 น.

สำหรับรายละเอียดอื่นๆ เป็นไปตามเดิมทุกประการ

ประกาศ ณ วันที่ 01 มิถุนายน 2566

(กฤษรา คงนวล)

ผู้จัดการแผนกจัดหาพัสดุ



Announcement of PTT Public Company Limited

Registration Number 0107544000108

PR No. 1120018607

Subject: Bid for Hiring of construction small sodium bicarbonate plant

As PTT Public Company Limited intends to invite written Bid for Hiring of construction small sodium bicarbonate plant

Place of delivery at Place of delivery The contractor shall deliver the job at the PTT Rayong Gas Separation Plant, 555 Sukhumvit Road, Mab Ta Phut, Muang, Rayong 21150

Within 9 times within 570 days (counting continuous everyday), starting after the effective date in PTT notification letter

according to the conditions/detail/drawing and the documentation attached to the announcement, which shall be considered as part of this Instruction to Bid, as follows:

- Terms of Reference	1 Set
- Form of Power of Attorney	1 Page
- Form of Bank Guarantee	1 Page
- PTT Supplier Sustainable Code of Conduct	1 Set
- Sample contract	1 Set

Pre-Bid Conference for clarification shall be held at VDO Conference Microsoft Team (Native speaker) on 10 April 2023 Registration for the Conference shall be during 10:00 to 10:15 and conference shall commence at 10:15 hours. (Speaker MR. APIVIT MALICHAJ Employee ID No. 540231 Tel. 086-6774006)

The bidder who does not attend the pre-bid conference shall be ineligible to tender.

Submission of Bid Price, evidence and technical documents shall be on 09 June 2023 at 09:00 - 15:00 hour, as follows:

- Procurement section , GSP Procurement & Inventory Management, Division. Gas Separation Plant Rayong, 555 Sukhumvit Road, Mabtapud, Muang, Rayong 21150

Person who is interested may purchase Bid Documents at the price of Baht - per set (Vat included) from 29 March 2023 to 07 April 2023 during 09:00 - 15:00 hours (NOTE : To reduce the spread of coronavirus disease 2019 (COVID-19), The vender who interested this bid please provide the "Memorandum of Association" and "Email who intend the bid clarification" via Email :



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kunswimol_b@pttplc.com, prangchanok.p.@pttplc.com within specific date/time as above and please specific the "No.1120018607" on Email subject as well) as follows:

- Procurement section , GSP Procurement & Inventory Management, Division. Gas Separation Plant Rayong, 555 Sukhumvit Road, Mabtapud, Muang, Rayong 21150
(MISS PRANGCHANOK PALAKAWONG Tel. 038-676178)

Announced on 29 March 2023

(MR. KRITSARA KHONGNUAL)

Procurement Section Head

Procurement section



Subject : จัดจ้างก่อสร้างโครงการ Small Sodium Bicarbonate Plant

By :
MR. APIVIT MALICHAJ
MR. TANAI CHOUYBUMRUNG
MR. NUTTHANON AROONPHUN
MISS PHIPHATSARA SUKPRASONG
MR. CHANWIT
CHANSATIRAPANICH

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Division/Department :
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Division

Related standard systems

Quality Safety Health Environment Lab Energy

Terms Of Reference

PTT Public Company Limited (hereinafter called "PTT") would be interested to hire EPC Contractor who will be responsible for providing engineering, procurement, construction, commissioning and related services of the Small Sodium Bicarbonate Project as following

1. Objective

To enhance the efficacy of the carbon dioxide capture unit utilizing Sodium Bicarbonate production technology through the implementation of an investment plan aimed at constructing a factory for Sodium Bicarbonate products.

2. Bidder Qualifications

2.1 Bidder shall carry out the business involving the products to be offered.

2.2 Bidder must not have the following characteristics as prohibited by the Blacklist:

2.2.1 Being a person or juristic person who has been convicted by the National Anti-Corruption Commission of Thailand (NACC), such a person shall no longer be considered to possess the prohibited characteristics described in this clause if they receive a final verdict of not guilty; or

2.2.2 Being a person or juristic person who is a party in any dispute or lawsuit against PTT that resulted in criminal penalties, excluding petty offenses.

The person or juristic person in the first paragraph shall be released from the prohibited characteristics (Blacklist) in the following cases:

2.2.2.1 A case where PTT is a defendant and a final judgment has been reached;

2.2.2.2 A case where PTT is the injured party and a final judgment has been reached indicating that the person did not commit the offense as charged;

2.2.2.3 A case where PTT is the injured party and a final judgment has been reached indicating that the person did commit the offense as charged, but the person has already served their punishment, completed their parole period, or has been awaiting sentence for at least three years; and

2.2.2.4 A criminal case that has been resolved through the withdrawal of the complaint or lawsuit, or has been disposed from the directory.



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In accordance with Clauses 2.2.2.1 to 2.2.2.4, if the counterparty is a juristic person, the directors of the limited company, partners with unlimited liability, or authorized directors of the public company limited, shall be subject to and exempt from the prohibited criteria (Blacklist) in the same manner as the juristic person.

In the case that Clause 2.2.2.3 applies and a final judgment is reached determining that the juristic person has committed an offense as charged, but it appears that the directors of the limited company, partners with unlimited liability, or authorized directors of the public company limited did not participate in the commission of the offense, and such directors or partners have resigned from the juristic person, then such directors or partners shall be released from the prohibited characteristics (Blacklist).

In the event that a final judgment imposes different period of punishment or parole on the juristic person, the directors of the limited company, partners with unlimited liability, or the authorized directors of the public company, the longest period of punishment or parole will be used to determine release from the prohibited characteristics.

2.2.3 Being a person or juristic person whose contract has been terminated by PTT due to committing the corrupted act against PTT;

2.2.4 Being a person or juristic person in the process of being ordered bankrupt by the court, or a person received a receivership order from the court in the context of a bankruptcy case, either temporarily or absolutely, and for which a final verdict has not been issued to resolve the case, cancel the bankruptcy, or discharge the bankruptcy, regardless of whether the court has approved a composition in bankruptcy for such person; and

2.2.5 Being a person or juristic person who has been in the Thailand designated list announced by the Anti-Money Laundering Office under the law of Counter-Terrorism and Proliferation of Weapon of Mass Destruction Financing Act. If the entity referred to in Clause 2.2 is a juristic person, the directors of the limited company, partners with unlimited liability, or the authorized directors of the public limited company, shall be included.

2.3 Bidder shall not be a person with a previous record of abandoning any work undertaken as declared by PTT and The Comptroller General’s Department.

2.4 Bidder shall be the person or persons who purchased/received the Bid Documents and may not assign to other persons the right to submit the Bid.



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In the case of the Bidder being a partnership/ consortium/ joint venture, the mentioned Purchaser/ Receiver must be a party of the said partnership/ consortium/ joint venture. Hence, the Bidder in the form of partnership/ consortium/ joint venture shall be obligated as a joint debtor to PTT.

2.5 On the day of the auction, should not have any joint interest with other bidders or is not a person who will cause obstruction for a fair auction.

2.6 Bidders must never be assessed at the level that should be improved (D) in annual evaluation after the completion of the delivery of products/services of PTT Public Company Limited - Gas separation plant during the past 1 year.

2.7 Bidder shall have the registered capital minimum 20 million Baht. In case of consortium or joint venture, at least one party shall fulfill this requirement.

2.8 The Bidder shall have adequate funds to meet financial obligations incident to this work and not financial problems against him from any party during the past 3 consecutive years (2019 - 2021).

2.9 The Bidder or a company associated with the Bidder shall have adequate technical knowledge and practical experience in accordance with all laws and regulation of Thailand.

2.10 The Bidder or Consortium Bidder or Joint Venture Bidder, at least one party shall have experience of ongoing or complete construction as EPC or EPCM in Food or Pharmaceutical Plant least 1 project reference minimum project value 400 million Baht. The evidence shall consist of sufficient detail on each project to indicate the magnitude and complexity of the project and a clear statement of the responsibility on the project. The given information should also include the in-service date of each project and the name of the owner of each project.

2.11 The prospective bidder, consortium bidder, or joint venture bidder must ensure that at least one party submits a project organization chart with the following minimum positions:

- Project Sponsor with a minimum of 10 years of experience
- Project Manager with a minimum of 10 years of experience
- Project Engineering Manager with a minimum of 5 years of experience



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- Project Control (Schedule and Cost Control) with a minimum of 5 years of experience
- Discipline Leads with a minimum of 5 years of experience
- Procurement Lead with a minimum of 5 years of experience
- Construction Manager with a minimum of 5 years of experience
- Site HSE Manage with a minimum of 5 years of experience
- Quality control manager with a minimum of 5 years of experience
- Food or Pharmaceutical Standard Specialist with a minimum of 5 years of experience.

Bidders are advised that noncompliance with the above requirements shall be caused for rejection of proposals.

2.12 The Bidder or Consortium Bidder or Joint Venture Bidder shall provide/assign License for Sodium bicarbonate unit specification in aneure F and providing the Owner the right for constructing, operating and maintaining the unit using Licensor’s technology. The technology should be commercially proven and capable of producing, as a minimum, desired requirement as indicated in this document.Contractr shall select Licensor in the Licensor that can be produced Sodium Bicarbonate as per product specification Annexure G.

- Selected Licensor shall be able to provide the latest technology for Sodium Bicarbonate production to meet product specification as specified in this document.
- Licensor shall have the Representative and Technical Service in Thailand or South East Asia to ensure that the after service and troubleshooting will be efficient and convenience.
- Licensor shall have the at least 1 reference units in commercial operation (at least 2 years operation) processing similar feedstock as specified in this document.
- Licensor shall submit laboratory result that meet product specification in annexure G

Contractor is required to bring out the salient features of the technology being offered. The following information/ documents in respect of Licensor’s process shall be submitted:



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- Complete list of Sodium Bicarbonate plant by the Licensor containing details of operating plant indicating owner name, licensed capacity, product quality, start-up date, scope of Licensor services provided, equipment supplied by Licensor etc. (see example format mentioned in Annexure I)
- Complete list of Sodium Bicarbonate plant by the Licensor under design, engineering or construction including revamp and their detail as per (a) above.
- Certificate from the users on their experience on the units licensed by the Licensor along with documentary proof for licensing of the reference unit.
- Process/product catalogues (standard brochures) and relevant recent publications.
- Duration for critical path and turnaround period for Sodium Bicarbonate unit.
- Details on the office which will support the project and the representative person

3. Bid Evidence

Bid shall be enclosed in sealed envelope consisting of separate envelopes as follows:

(3.1) Envelope of bid qualification

(3.1.1) In case of Bid by an individual business owner, there shall be enclosed a copy of a value added tax certificate and a copy of a commerce registration certificate, certified by the owner or manager and affixed with the official seal (if any).

(3.1.2) In case of Bid by a company or partnership registered in Thailand, there shall be enclosed a certificate of incorporation issued by the Ministry of Commerce which is not more than 6 (six) months recent as from the date after the day of issuance up to the date of submitting Bid document. Unless it is an original, such certificate shall be affixed with a signature of the authorized person and the official seal of the company or partnership in authentication thereof.

(3.1.3) In case of Bid by a company or partnership registered in a foreign country, Bidder shall enjoy no immunity or protection allowing non-submission to Thai court, unless such privileges and immunities have been waived by the instruction of Bidder’s government..

(3.1.4) In the case where the authorized person of an individual business owner, company or partnership (“Entity”) does not sign the bid documents by himself and appoints a person to sign such documents on behalf of the Entity, such entity shall



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have to enclose a valid power of attorney which clearly and correctly states such authorization. The bidder may also have another person submit the said bid documents to PTT. However, the bidder has to certify that he will be responsible to PTT for any acts of such person in relation to submitting of the bid documents as if it is done on the bidder's behalf.

(3.1.5) Certified copy of Thai ID./passport of the authorized signatory or copy of Thai ID./passport of grantee and grantor attached to a power of attorney.

(3.1.6) In the case where registration of value added tax has been effected, there shall be enclosed a copy of VAT Certificate (Form Bhor. Por. 20).

(3.1.7) In case of Bid by a company or partnership registered in a foreign country, there shall be enclosed

- 1) Certificate of Incorporation and/or Memorandum of Association and/or any other documents likewise issued by the competent agency/organization, which enables to identify the authorized person including Bidder's registered objectives that accord with the procurement work.
2) Articles of Associations (If any)
3) Power of Attorney) (If any)
4) Certificate of specimen signature or other documents that present signature.(If any)

(3.1.7.1) The list of documents in (3.1.7) 1) - 3) must be notarized by Notary Public and legalized by Thai Embassy or Thai consulate which has the jurisdiction, not more than 1 year recent as from the date after the day of notarization and legalization up to the date of submitting Bid document.

(3.1.8) Project References of Bidder in accordance with the requirements

(3.1.9) In case of Bidder is consortium or joint venture, the following information is required.

(3.1.9.1) Description of the Consortium / Joint Venture, the division of responsibilities and the Scope of Work of each member during engineering, procurement, construction, training and commissioning.

(3.1.9.2) Name of the leader of the Consortium or Joint Venture and names and functions of the authorized representative(s) of the Consortium or Joint Venture.

(3.1.9.3) Complete copy of the Consortium or Joint Venture agreement either signed by each of the members or evidence provided that each of the members will sign the agreement on issue of any Notice of Award.



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(3.1.9.4) Confirmation of joint and several liability (The leader of the Consortium or Joint Venture must be nominated. The leader shall be authorized to commit the Consortium or Joint Venture and to act on its behalf in all matters related with the Bid and the Contract.

(3.1.9.5) Description of projects and working relationships, if the members have been working together previously on other projects.

(3.1.9.6) The Bid shall be signed so as to be legally binding on all partners. Signatory (ies) must have Power of Attorney, approved by public notary and certified by the Thai Embassy or Thai Consulate.

(3.1.9.7) The members of the Consortium or Joint Venture shall remain firm and committed throughout the bidding period and after CONTRACT Award.

(3.1.9.8) No changes in the agreement of the Consortium or Joint Venture or its organization will be allowed unless approved by PTT; otherwise, the Bid will be rejected. If the agreement is allowed to change, the Bidder shall bear all costs and expenses incurred in providing PTT with the new agreement.

(3.1.9.9) Each Bidder will be limited to Submission of one Bid only.

(3.1.10) Covering Letter

(3.1.11) Information on Bidder: 2 copies of hardcopy and 1 electronic format

(3.1.11.1) Names and functions of the authorized representative (s) of the Bidder.

(3.1.11.2) Organization chart of Bidder's company showing details of Bidder's corporate organization.

The Bidder shall provide evidence that they comply with the eligibility requirements specified in this Article 2 and submit all of the qualification

(3.2) Envelope of technical documents: 2 copies of hardcopy and 1 electronic format

The Technical Proposal will be considered for evaluation only after the evaluation of the Qualification Proposal and the Bidder is determined to be technically qualified. Bidders who fails to meet the requirements stated below will not be considered in the next evaluation step. Evaluation of the Bidder's technical proposals will be based on the following:



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(3.2.1) PROJECT EXECUTION PROPOSAL, which shall contain as following

(1) Project schedule (Level 1)

(2) Project execution plan

- Project management
- Engineering
- Procurement
- Construction execution
- Commissioning and testing execution
- Planning, scheduling, and process control
- Document control

(3) Project organization including with personnel CV. The personnel CV shall display Professional Engineering License Level (if any).- Key PersonnelBidder shall also provide key personnel experience records with the bid. These records should consist of a one or more page resume highlighting the relevant experience for each person.

Key Personnel proposed by Bidder must meet the indicated minimum years of relevant experience:

- Project Sponsor with a minimum of 15 years of experience
- Project Manager with a minimum of 15 years of experience
- Project Engineering Manager with a minimum of 10 years of experience
- Project Control (Schedule and Cost Control) with a minimum of 5 years of experience
- Discipline Leads with a minimum of 5 years of experience
- Procurement Lead with a minimum of 5 years of experience
- Construction Manager with a minimum of 5 years of experience
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- Quality control manager with a minimum of 5 years of experience



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- Food or Pharmaceutical Standard Specialist with a minimum of 5 years of experience.

3.2.2 Technical data

Bidder shall strictly comply with the requirement specified in 2.9 -2.11. Failure to do so may result in the rejection of its Bid.Bidder shall submit documents as following requirement

(3.2.2.1) Process

- Basic Engineering
- Design Data
- PFD
- Main Equipment list
- Utility requirements
- Basis of Design
- Process description
- Control Philosophy

(3.2.2.1.2) Plant Performance Guarantee(3.2.2.1.3) License AgreementBidder shall provide the draft of license agreement and technical assistance agreement with Licensor to PTT for consideration. (3.2.2.2) Safety

- PHA study procedure

(3.2.2.3) Electrical

(3.2.2..3.1) Brand list of electrical equipment; MCC panel , LV motors and MV switchgear (if any)

(3.2..2.4) Instrument



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(3.2.2.4.1) Brand list of instrument equipment; Control valves, ON-OFF Valves, Shut-off valves, DCS system, SIS system, FGS system (e.g. gas detector, fixed monitor, deluge valve), PLC system of Advanced Oxidation Package

(3.2.2.4.2) Instrument system configuration architecture

(3.2.3) Exceptions and Deviations List from PTT's Terms & Conditions (Attachment 3.7). (No deviation from the PROJECT SPECIFICATION shall be preceded by BIDDER without prior written approval from PTT. PTT reserves the right to consider BIDDER who is NO deviation as the first priority).

(3.2.4) Unpriced Commercial Proposal, which shall contain all payment terms and commercial conditions, as for Priced Commercial Proposal, but excluding all lump sum prices specify in Annexure N

(3.3) Envelope of price commercial proposal: 1 hardcopy

PTT will open and evaluate the Commercial Proposal of Bidders who are qualified in (3.1) and (3.2).

(3.3.1) Fixed Lump Sum Bid Price. The Bidder shall provide the lump sum price in Thai Bath. This should clearly show the price for the Bid in which there are no deviations to any part of the TOR. The evaluation of the Bidder's Commercial Proposal will be based on the Life-Cycle Cost Analysis (LCCA) for 15 years of operation. Commercial Proposal will be evaluated by using PTT's financial model as Attached in annexure L. Bidder shall provide product output, recovery rate and other utilities usage in accordance with annexure L, Pricing Schedule. Bidder who proposes the highest Net Present Value (NPV) in PTT's financial model and the proposed investment cost (CAPEX) not over PTT's budgetary will be invited to finalize the Contract with PTT first. To facilitate evaluation and comparison, PTT will convert all bid prices to Thai Baht at the average selling rate published by the Bank of Thailand on the Commercial Proposal Bid Submission date.

(3.3.4) Unit Rates

Unit rates shall be proposed by Bidder for all categories of personnel, construction, equipment and field WORK to be used for any Change of WORK according to the provisions These rates shall also apply where the Change is reduction in the SCOPE OF WORK.

The rates shall be quoted in Thai Baht for costs incurred in Thailand



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In addition, Bidder shall provide a procedure for fixing the cost of Changes involving equipment or materials. This shall include a percentage to cover the administration costs associated with the procurement activities.

(3.4) Communication during the Bidding Period

All correspondence during the Bidding Period including clarification on the TOR shall be addressed to

PTT PUBLIC COMPANY LIMITED, RAYONG GAS SEPARATION PLANT
SMALL SODIUM BICARBONATE PLANT PROJECT

555 Sukhumvit Road, Map Ta Phut
Muang, Rayong 21150 Thailand
Attention: MR.KLOT BOONYAWATANA
Project Manager
Email Address: klot.b@pttplc.com
Telephone: +66 891057038

Attention: Mr. Apivit Malichai
Project Engineer
Email Address: apivit.m@pttplc.com
Telephone: +66 866774006

Bidders should direct all communicating to PTT. Communication with PTT in PTT's bid evaluation, bid comparisons or Contact award decisions may result in the rejection of the Bidder's bid.



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MR. NUTTHANON AROONPHUN
MISS PHIPHATSARA SUKPRASONG
MR. CHANWIT
CHANSATIRAPANICH

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Division/Department :
Technical and Asset Engineering
Division

Related standard systems

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(3.5) Interpretation and Clarification of TOR

It is the responsibility of the Bidder to advise PTT of any discrepancies, errors or omissions in the TOR that need to be resolved to enable the Bidder to have a clear understanding of the TOR. Failure to do so is at the sole risk of the Bidder and no relief will be given by PTT for any errors and omissions.

If Bidder has questions concerning any technical or commercial matters, he shall request interpretations or clarifications in writing. Only questions received before two weeks of bid submission will be replied to.

Any response by PTT to a question will be in the form of a question and answer and will be distributed to all Bidders in order to keep the Bid on a comparable basis, without releasing the identity of the original Enquirer. All information contained in this reply shall be deemed to form part of the TOR.

As necessary, addenda to the TOR will be issued.

Bidder's Bid shall be in full conformity with the requirements set out in this Invitation to Bid. Clarifications, deviations, exceptions, exclusions, conditions, variations, assumptions, etc. in Bidder's proposal shall be considered as deviations from the Invitation to Bid.

Where Bidder's Bid contains no specific mention of deviations from the Invitation to Bid, the Bidder shall be deemed to accept the terms, conditions, and requirements of said documents.

(3.6) Site Visit and Pre-Bid Conference

Bidders is required to attend a pre-bid conference and site visit for further explanations or conduct SITE Examination at the GAS SEPARATION PLANT, Map Ta Phut, Rayong. The pre-bid conference and Site visit will be the only meeting for the Bidder with PTT to Bid Submission. The purpose is to enable the Bidders to acquaint themselves with all matters that may affect the Bid. The bidders shall take responsibility for all expense (traveling cost to the plant, accommodation, etc.) in order to visit site.

After the Site visit and pre-bid conference the Bidder shall be deemed to have fully informed himself on the SITE conditions, the means of access, the possibilities of accommodation and other matters which may influence the Bid. Any lack of



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knowledge of local matters will not relieve the Bidder from his obligations and responsibilities regarding his Bid or any subsequent AWARD OF CONTRACT.

For Site visit, not more than four (4) representatives from each Bidder will be allowed on the Site visit or at the pre-bid conference. The Bidders must confirm by a letter of the representatives including full name, position and a copy of ID card or passport at least seven (7) days before the site visit. The representative has to come on time in order to attend the safety training program at safety training room in the plant about 2 hours before visit site.

Bidder shall submit in writing not later than 3 days before the visit any queries he intends to raise during the pre-bid conference. He should also advise any specific points regarding the SITE that he wishes to inspect. The questions and responses will be summarized after the pre-bid conference and distributed to all Bidders and become part of the TOR. Bidder’s personnel is permitted to enter PTT’s premises during the Site visit only on the condition that PTT accepts no liability with respect to the Site visit and that the Bidder retains full responsible for any injury, loss or damage to his personnel.

Failure to comply with all requirements shall have the following consequences:

(3.6.1) Where the Terms of Reference specify the consequences of non-conformity with such requirement, Bidder shall be bound by such consequences, which may preclude Bidder from submission of a bid proposal.

(3.6.2) Where the Terms of Reference does not specify the consequences of non-conformity with such requirement, Bidder retains the right to submit a bid proposal and is taken to have accepted and understood all particulars and the SITE without reservation.

(3.7) Ownership of Documents and Confidentiality

The TOR and all copies thereof remain the property of PTT and shall be promptly returned upon PTT’s request. All information contained in the TOR or issued by PTT on its behalf in the course of bidding shall be treated as strictly confidential by the Bidder and shall only be used for the preparation of the Bid..

(3.8) Amendment of Bidding Documents



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(3.8.1) At any time prior to the deadline for submission of bids, PTT may amend the bidding documents by issuing Addenda.

(3.8.2) Any Addendum thus issued shall be part of the bidding documents pursuant to TOR and shall be communicated in writing or by email or by facsimile to all Bidders of the bidding documents. Prospective bidders shall promptly acknowledge receipt of each Addendum by cable to the Employer.

(3.9) Submission of Bid

(3.9.1) Proposal shall be clearly marked as follows:

“CONFIDENTIAL”

“SMALL SODIUM BICARBONATE PLANT PROJECT”

“PRICED COMMERCIAL PROPOSAL” or “UNPRICED COMMERCIAL PROPOSAL”

Or “BID SECURITY” or “PROJECT EXECUTION PROPOSAL” or “TECHNICAL PROPOSAL”

“ORIGINAL” or “COPY”

(3.9.2) The Bid shall be addressed and submitted to

PTT PUBLIC COMPANY LIMITED, RAYONG GAS SEPARATION PLANT

SMALL SODIUM BICARBONATE PLANT PROJECT

555 Sukhumvit Road, Map Ta Phut

Muang, Rayong 21150 Thailand

Attn: MR.KLOT BOONYAWATANA

Project Manager

(3.9.3) Failure to submit any of documents shall lead to rejection of the Bid unopened.

(3.9.4) The Bid shall be delivered to the above address by Bidder’s authorized representative on Bid Submission Date between



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09:00 a.m. to 03:00 p.m. Bids received outside this time period at the above address will not be considered and returned unopened.

4. Bid Submission

- 4.1 Bidder shall fill the unit price or price of each item as well as the total price in the original Bid form issued by PTT or the quotation form of Bidder which shall have the contents in accordance with the Bid form issued by PTT, which shall include, but not be limited to, date of quotation, name of Bidder, subject of quotation, unit price or price of each item and the total price, and the wordings stating that Bidder shall comply with the terms and conditions of PTT. The Bidding Price shall exclude value added tax, be in THB , cover all expenditures incurred until delivery. The amount in number and word shall clearly be stated. Any deletion or correction shall be initialed by the authorized person and affixed with an official seal (If any). Where the unit price or price of each item is inconsistent with the total price, or there is discrepancy between the “number” and “word”, then, the provisions of the Civil and Commercial Code shall vern such inconsistency or discrepancy. Bid shall be valid for a period as determined by PTT. Unless otherwise determined by PTT, Bid shall be valid for a period of not less than 90 days as from date after the day of the Bid submission or according to conditions determined by PTT and upon the Bidder irrevocably submitting bid documents according to Clause 3 and may not be withdrawn.
- 4.2 Upon the expiry of submitting the proposal and bidding, the submission of proposal and bidding to PTT is forbidden.
- 4.3 PTT procurement committee will check the qualifications of the bidder, (1) if the bidder has a joint benefit with other bidders. In the event, the bidders have a joint benefit with other bidders, they shall be disqualified from the procurement. (2) PTT shall verify bidder’s qualification by using reliable sources in accordance with international standards based on transparency and fairness. In the event that the bidder fall into any prohibited characteristics (Blacklist) as per clause 2.2, the procurement committee reserves the right to reject the proposal from those bidders.

5. Bid Security



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Bidder is not required to place Bid Security.

6. Bid Evaluation Criteria

- 6.1 For the consideration of this bidding submitting, PTT will consider by using the rules on price
- 6.2 Bidder who won the auction
PTT will consider from Highest Net Present Value
- 6.3 In the event the bidder does not qualify as per clause 2, the evidences submitted are incorrect or incomplete as per clause 3 or the price is incorrect as per clause 4, the PTT procurement committee shall not consider the bidder unless the bidder’s specification or the purchased products ’s price is incomplete or the details are different from the company’s conditions which is not an essential matter and does not cause disadvantage to the other bidders or there is a slight error, the PTT procurement company shall consider to ease the disqualification of that bidder
- 6.4 PTT reserves the right to not to ease the consideration of the following bidders;
 - (1) Does not have the name in the list of the people buying or receiving auction documents from PTT
 - (2) Has proposed details that differ from the company’s condition which are essential or are a disadvantage to other bidders.
- 6.5 In the event, the bidders have wrongfully proposed for the bidding such as submitting false documents or has appointed an ordinary person or legal entity in his behalf, the company shall revoke the auction and punish the bidder, no matter if the bidder is been chosen or not.

In the event, the bidder has proposed a low price, and it can be determined that the work cannot be operated as per the scope of work, PTT procurement committee will let the bidder submit the clarification together with the evidences to ensure that the work will be complete. If the clarification is unsound, PTT will reject the proposal or the price of the bidder. The bidder shall not claim for damages or expenses from PTT. PTT’s discretion shall be final

- 6.6 Prior to affixing the signature in the agreement, PTT may revoke the auction if it appears the bidder who won the bidding or who is chosen has joint benefits, has advantage with other bidders, is an obstruction for the



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competition, mutually represent other bidder or bid officer or it appears that the bidder is wrongfully proposing the bid.

6.7 PTT will provide bid evaluation procedure as Annexure L

7. Contract and Performance Security

7.1 Successful Bidder chosen by PTT shall contact PTT

(1) In case of the procurement which is not over 5,000,000 (five million) Baht or is not required to proceed under PTT conditions to be done in a form of a contract, the Successful Bidder which PTT agrees to perform Hire shall contact PTT to receive Work Order within 7 days from the date after the day notified by PTT (In the case of no Contractual Guarantee) or within 15 days from the date after the day notified by PTT (In the case with Contractual Guarantee)

(2) In case of the procurement which is above 5,000,000 (five million) Baht or is required to proceed under PTT conditions to be done in a form of a contract, successful bidder chosen by PTT shall contact PTT to receive letter of intent within 7 days from the date after the day notified by PTT and to contact PTT to enter into a contract with PTT within a period determined in such letter of intent.

In the event of non-compliance with the said clause 7.1 (1) or 7.1 (2), PTT shall confiscate the security (if any) If PTT needs to acquire substitution procurement from another person at a higher price, Bidder shall be responsible to pay PTT the difference within 30 days from the day after the date of notice thereof by PTT. PTT also reserve the right to claim any other damages arising therefore.

7.2 In execution of a Contract or Work Orderr, Successful Bidder is required to place the Contractual Guarantee. In the case where the Contractual Guarantee is required and unless otherwise stipulated in the details attached to Work Order, Successful Bidder chosen by PTT (hereinafter called “Contractor”) shall submit to PTT, cash or Bank Guarantee or Thai vernment Bond or PTT Bond or PTT debenture 5percent of the price of the Contract or Work Order (the fraction remaining shall be round up) to ensure the performance of its obligations under Contract/ Work Order. The Contractual Guarantee shall be returned when Contractor has been discharged from all obligations under the Contract/ Work Order.



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- 7.3 Contractor shall be responsible to pay revenue stamp required for the Contract or Work Order at the rate stipulated in the Thai Revenue Code.
- 7.4 In case where Successful Bidder fails to enter into the Contract within the period of time specified by PTT or the Contractor fails to comply with the terms or conditions under the contract without reasonable cause, such person, upon PTT’s consideration, will be regarded as abandoner and his name will be removed from the Approved Vendor List of PTT.

8. Delivery

- 8.1 The contractor shall deliver the job to the PTT 9 times within 570 days (counting continuous everyday), starting after the effective date in PTT notification letter
- 8.2 The delivery term is DDP at PTT Rayong Gas Separation Plant AS PER INCOTERMS 2020

9. Place of delivery

The contractor shall deliver the job at the PTT Rayong Gas Separation Plant, 555 Sukhumvit Road, Mab Ta Phut, Muang, Rayong 21150, AS PER INCOTERMS 2020

10. Payment

- 10.1 PTT shall make the payment
 - PTT shall make the payment 9 times to the contractor on the thirtieth (30th) days after PTT’s Acceptance Committee has accepted the service successfully
 - 1st Payment: 20% of the price of the Contract after the Contractor issues a purchase order for Process Licensor.
 - 2nd Payment: 10% of the price of the Contract after PTT approves the Basic Engineering details.
 - 3rd Payment: 10% of the price of the Contract after the Contractor issues a purchase order for Long Lead equipment (Lot 1)
 - 4rd Payment: 10% of the price of the Contract after the Contractor issues a purchase order for Long Lead equipment (Lot 2)



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11.2.3 If the warranted crystal size figure for the impurities in the product as defined in Annexure J, has not been achieved due to reasons solely attributable to Contractor, the liquidated damages shall total 0.5% of the Contract Price for every full 20 micron of deficiency up to a maximum of five percent (5%) of the Contract Price. The sum of all liquidated damages Contractor has to pay for process warranties is capped at a maximum of ten percent (10%) of the Contract price.

12. Liability

- Liability Notwithstanding the foregoing, CONTRACTOR's maximum liability to PTT (including without limitation liability resulting from breach of contract, tort, negligence, breach of statutory duty, misrepresentation or otherwise for any loss, damage, costs or expenses, or injury ("Damages") sustained by PTT and arising out of or in connection with this Contract) shall respond to all damages but not exceed the total contract value.

Nothing in this paragraph shall exclude or limit the Contractor's liability to PTT for fraud or fraudulent concealment, gross negligence or willful misconduct.

- Consequential Damages Notwithstanding any other provision in this Contract or elsewhere to the contrary, Contractor shall not be liable for any special, incidental, indirect or consequential loss or damage of any nature, arising at any time, from any cause whatsoever, including loss of revenue or profit.

13. Governing LawThe Contract shall be governed by and interpreted in accordance with the laws of the Kingdom of Thailand.

14. Warranty and Guarantee

14.1 The contractor shall warrant its work products for 12 months following the date the PTT's committee has accepted the service successfully in accordance with the conditions set by the PTT.

14.2 The contractor shall deliver the warranty certificate to the PTT with the supplies/ equipment. (if any)

15. Advance Payment

No Advance Payment



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16. PTT Supplier Sustainable Code of Conduct) (When the contract having the value from 2 million Baht)

Successful Bidder who agrees to purchase/work/rent , shall accept and conform with the "PTT Supplier Sustainable Code of Conduct" PTT reserves the right to inspect if Bidder is in compliance. With the PTT Code of Conduct.

Vendors who have a plan to run business with PTT must act along PTT regulations and conditions, sustainable practice for PTT groups' vendors, including:

16.1 Vendors must run firms strictly along involved rules which covered business ethics, social responsibility, security and environment, for example, labor protection law, safety law, and environmental law. Moreover, vendors must run business with transparency, honesty and must not violate the intellectual property rights.

16.2 Vendors must have qualifications related to ESG Interception Criteria including:

- (1) Vendors must not be tolerating, permitting, or engaging in bribery, corruption, or unethical practices whether in dealings with public officials or individuals in the private sector.
(2) Vendors must have involved work permits along the defined laws.
(3) Vendors must not be judged to false in term of financial, environment, security and labor court. Furthermore, vendors must not be found in list of personality, juristic person and company that run business against Thai laws within 3 years before launching the auctions.
(4) Vendors must have firms' policies to will not hire youth labor that age below 15 years old.
(5) Vendors must have enterprises' policies to pay labor's compensation at least the defined legal minimum wage. In addition, vendors must not force employees to work more than the legal defined hours.
(6) Vendors must have SSHE management system in working place along the defined law and concern about employee's safety.
(7) Vendors must have management system of working area and also environmental liability, for instance, the leaking of dangerous substance in soil and underground water.

17. Contractor's performance evaluation

17.1 PTT shall evaluate vendors after the completion of the delivery of products/services in each delivery period, based on their work performance.



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- 17.2 PTT reserves the right to use the vendor evaluation’s result in order to determine the bidder’s qualification for the next PTT’s bidding.
- 17.3 In the case of any vendors in the PTT Approved Vendor List(PTT AVL) is given graded “D” from the vendor evaluation under a specific type of work, PTT reserves the right to delist such vendors from type of work hereunder. The vendors shall not be permitted to register with PTT AVL under such type of work for at least 3 years from the delisted date.
- 17.4 If the vendor has any queries with regards to the vendor evaluation, the vendor shall submit the request in writing to the procurement unit of PTT for the explanation of such evaluation. The copy of the purchase order/contract and work result must be attached to the request. The vendor can access the system *ptvm.pttplc.com* for the results of vendor evaluation

18. Personal Data Protection

Both parties agree to comply with the Thai Personal Data Protection Act and all applicable personal data protection laws including any subsequent amendments, other relevant rules and regulations of the jurisdiction where such party is mandated, in respect of collection, use and/or disclosure of any personal information. In this regard, each party represents and warrants that it has right and authority to disclose any personal information of any third party to the other party and has obtained all necessary consents from the relevant third party to disclose such personal information. Any collection, use and disclosure of personal information hereunder shall be conducted to the extent it is necessarily required for and in compliance with such law(s).

In the event that any performance hereunder of either party is considered to be a data controller or a data processor under Thai Personal Data Protection Act including any amendments, the parties agree to enter into a Data Processing Agreement, Data Sharing Agreement or any other similar documentation to ensure adequate level of data protection as required by law and such document shall be incorporated hereinto.



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Privacy Notice

<https://pttpdpa.pttplc.com/Privacy/106107>

1 **General Project Information**

PTT Public Company Limited (referred as “Owner”) is presently considering the construction of a new facility for the production of Sodium bicarbonate food and Pharmaceutical grade in PTT (GSP) Mat Ta Phut plant in Rayong. The project is registered under the name SODANA. (referred as “Project”) The Sodium Bicarbonate plant will be using Carbon Dioxide (CO2) feed stock from RTO unit from existing plant.

The Project facility is organized with;

- Control room, Electrical room, QC laboratory room, Changing, locker room, Cloakroom, Operator Office, Maintenance room (Instrument& Mechanical) and Rest room.
- Raw materials (Na2CO3) storage and unloading facilities.
- Chemical (CaCl2) feed system.
- Water treatment unit (Demineralize water) fee issue from Owner.
- Chiller and Steam generation unit.
- Air compressor system. (Instrument air/Utilities air)
- Nitrogen system (Bomb)
- The Sodium bicarbonate production unit.
- Product silos, Product Packaging units, Palletizer unit, Product warehouse facilities, Truck loading facilities, Forklift parking, charging area and Logistic office.



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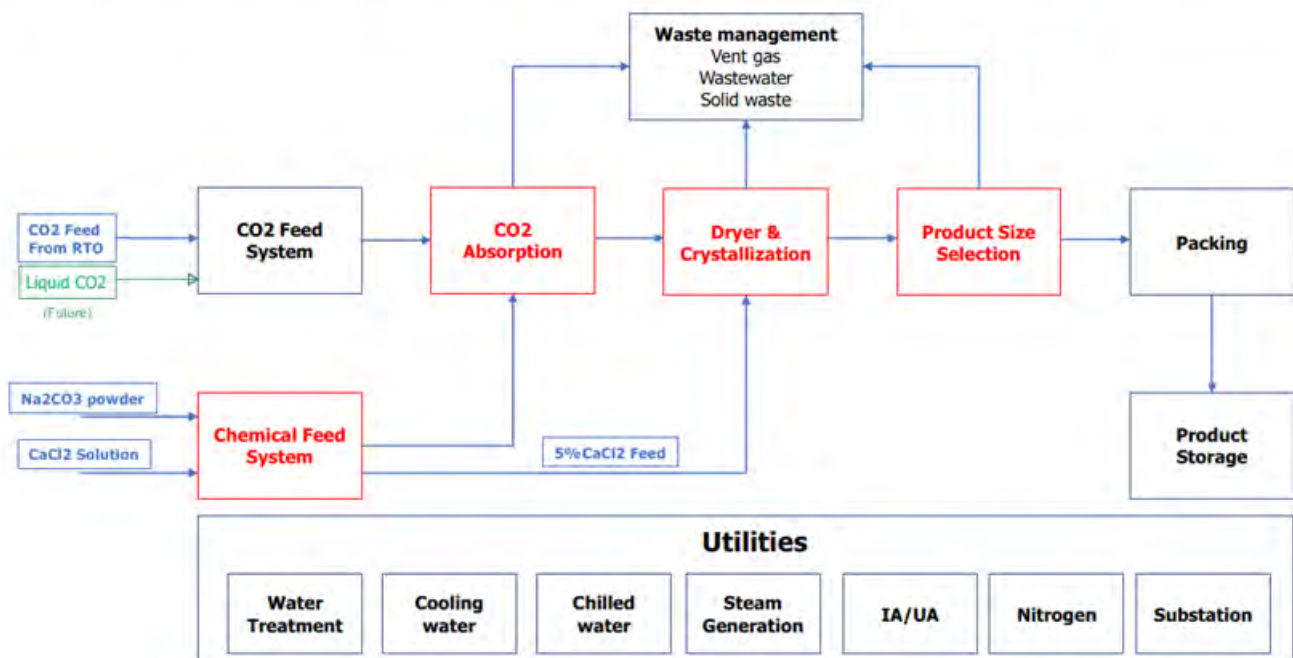
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- Road, Storm water drainage system, Contaminates waste water collection and storage system (Purge water and Drain and Drain/wash/Flush water, Fire hose station, Portable fire extinguisher, Safety shower & Eyes washer, Dust collector, Vacuum cleaner for maintenance, Fence and Guard house.
- CCTV Public address system

Figure 1 showing simplify process block diagram

SB Block Flow Diagram

SB Scope
 Design by Licensor



SODANA Project implementation can be described as following;

Construction and installation of Sodium bicarbonate plant with capacity of 8,000 KTA.



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1.1 Service Objective

The technical proposal from the Contractor/Licensor shall be based on the basis as outlined in this section;

- The selected Contractor to select Licensor for Sodium bicarbonate technology based on Owner criteria in Annexure F and propose the Proposal based on selected Licensor.
- The selected Contractor/Licensor to provide Sodium bicarbonate unit Technology License, engineering, design, supply of equipment and materials, construction and commissioning of the Project on a Lump Sum basis for both ISBL and OSBL. Whole factory shall be met GMP/PICS, HACCP and HALAL requirement.
- The selected Contractor shall responsible to manage the selected Licensor for the successful demonstration of Performance Guarantees for the Plant including guarantees provided by the Licensor under the single contract between Owner and Contractor.
- The selected licensor to provide installation support/supervision and commissioning support for 3 months.

Contractor can propose alternative approach if there is benefit to Owner.

- The selected Contractor to prepare necessities documentation/drawings for Thai Authorities permit approval e.g. BOI, IEAT, Thai FDA, and The Central Islamic Council of Thailand.
- The selected Contractor will be a representative of the Owner in the procedure of custom clearance, permit and approval, requisition of tax benefit (BOI). Including procedure of construction permit (IEAT), manufacturing certify-GMP & HACCP and operation permit (Thai FDA) and HALAL product certify (The Central Islamic Council of Thailand). All cost and fee will born by Contractor.
- The contractor will be a representative of the Owner in the procedure to apply for permission regarding the Sodium bicarbonate product as table belowed



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CHANSATIRAPANICH

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Quality	Safety	Health	Environment	Lab	Energy

การดำเนินการขออนุญาตเกี่ยวกับผลิตภัณฑ์ Sodium Bicarbonate

ลำดับ	หน่วยงานที่เกี่ยวข้อง	รายการกิจกรรม	ระยะเวลาดำเนินการ	อ้างอิงตามประกาศ	หมายเหตุ
1	สำนักงานคณะกรรมการอาหารและยา (อย.) กระทรวงสาธารณสุข	ขอพิจารณาอนุมัติแบบแปลน	41 - 101 วันทำการ	<u>คู่มือสำหรับประชาชน</u> : การขอรับการพิจารณาแบบแปลนสถานที่ผลิตยาแผนปัจจุบัน และสถานที่ผลิตยาแผนโบราณ	เอกสารนี้เป็นการรวบรวมข้อมูลขั้นต้นเท่านั้น รายละเอียดกิจกรรม
2		ขออนุญาตผลิตยาแผนปัจจุบัน	30 วันทำการ	<u>กฎกระทรวง</u> กำหนดหลักเกณฑ์ วิธีการ และเงื่อนไขการผลิตยาแผนปัจจุบัน พ.ศ. 2546 <u>กฎกระทรวง</u> กำหนดหลักเกณฑ์ วิธีการ และเงื่อนไขการผลิตยาแผนปัจจุบัน ฉบับที่ 2 พ.ศ. 2563 <u>คู่มือสำหรับประชาชน</u> : การขออนุญาตผลิตยาแผนปัจจุบัน	ประกาศฯ คู่มือต่าง ๆ รวมถึงวงทำการ ให้เป็นไปตามที่เจ้าหน้าที่สำนักงานคณะกรรมการอาหารและยา (อย.) กำหนด
3		ขออนุญาตผลิตยาตัวอย่าง	1 วันทำการ	<u>คู่มือสำหรับประชาชน</u> : การอนุญาตผลิตยาตัวอย่างเพื่อขอขึ้นทะเบียนตำรับยาแผนปัจจุบัน (ผ.ย.อ)	
4		ขอหนังสือรับรองมาตรฐานการผลิตที่ดี (GMP)	11 เดือน	<u>คู่มือสำหรับประชาชน</u> : การตรวจประเมิน GMP สถานที่ผลิตยาภายในประเทศ	
5		ขอจดทะเบียนเภสัชภัณฑ์	5 วันทำการ	<u>ประกาศสำนักงานคณะกรรมการอาหารและยา</u> เรื่อง กำหนดหน้าที่ของผู้รับอนุญาตเกี่ยวกับเภสัชภัณฑ์ที่เป็นสารออกฤทธิ์ หรือเภสัชภัณฑ์กึ่งสำเร็จรูปที่มีส่วนผสมของสารออกฤทธิ์ <u>คู่มือสำหรับประชาชน</u> : การจดทะเบียนเภสัชภัณฑ์/การเพิ่มชื่อ ผู้ผลิตเภสัชภัณฑ์ในฐานข้อมูล	

- The selected Contractor/Licenser to provide training to Owner staff in accordance with Owner’s engineering specification ES.99.089 specification for training in Annexure I.

1.2 Unit Design Capacity and Design Objective

The Sodium Bicarbonate plant shall be installed to production Sodium Bicarbonate is capacity of 8,000 KTA (1 train x 8,000 KTA). Contractor to indicate the unit capacity design margin in their proposal. The Equipment Design Margin shall be +10% from rated design capacity.

Table 1 Objective for Technical Proposal



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Technical Proposal		Scope of Work
Project Schedule		Supply License and EPC services to Meet Owner's and Project specification's requirement.
Product	Product project requirement.	Supply the Unit based on selected Licensor's Technology to maximize production 8,000 KTA. Sodium Bicarbonate Products shall be meet the required qualities as per Annexure G.
Plot Space	Unit design shall be as compact as possible in order to fit in available plot space	Design the Sodium bicarbonate plant to fit with approximately 3,200 m ² (Approximately 2 Rai) maximum including ISBL and OSBL
Utility and Consumable Material Consumption	To minimize Utility and consumable consumption material	Unit design shall be considered to minimize utility consumption and consumable material as much as possible.

1.3 Safety and Environmental Aspect

- The unit design shall incorporate state of art environmental control strategies The proposed technology is being set up in an environmentally sensitive area and hence it has to be ensured that the impact of this unit on the environment is minimized.



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- Contractor to provide information regarding quantity & quality of continuous & intermittent gaseous, liquid and solid effluents generated during operation, start-up, shutdown etc. from the unit including the duration & rate of intermittent streams.
- Any pollutants generated in the process shall be indicated in terms of quantity and quality. Recommendation for effective and proven treatment method is to be submitted along with the offer.
- Contractor to perform Risk assessment on product safety, Quality, Environment and safety to comply with Thai FDA/PICS and GMP/PICS.

1.4 GMP, FDA, HACCP and HALAL requirements

Contractor to prepare and perform Qualification and Validation Master plan (VMP) for each requirement (GMP, FDA, HACCP and HALAL). The plan shall be defined requirements for manufacturing activities in order to ensure that manufacturing achieves compliance with all relevant regulatory and business requirements. Compliance with Good Manufacturing Practices (GMP, at minimum ICHQ7) is a standard applicable for the manufacturing Active Pharmaceutical Ingredients (API) and is suitable for Medical Devices components and Guideline for Audit as per The Notification of Ministry of Public Health B.E. 2554 (รายละเอียดเกี่ยวกับหลักเกณฑ์และวิธีการในการผลิตยาแผนปัจจุบัน และแก้ไขเพิ่มเติมหลักเกณฑ์และวิธีการในการผลิตยาแผนโบราณ ตามกฎหมายว่าด้วยยา พ.ศ. 2559) (Re: Modern Medicine (Thai FDA GMP PICS) (คู่มือการตรวจประเมินสถานที่ผลิตยาแผนปัจจุบัน ตามประกาศกระทรวงสาธารณสุข เรื่อง การก าหนดรายละเอียดเกี่ยวกับ หลักเกณฑ์และวิธีการในการผลิตยาแผนปัจจุบัน ตามกฎหมายว่าด้วยยา พ.ศ. 2554).

The initial Validation Master plan (Engineering, procurement and Construction) shall consist;

- Equipment Criticality & Risk Assessment (Product safety, Quality, Environment and Safety)
 - Equipment Qualification
 - Qualification Plan (Document)
 - Design Qualification (Protocol / Report)
 - Factory Acceptance Test (FAT)
 - Site Acceptance Test (SAT)



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- Engineering Installation and Commissioning (Protocol / Report)
- Installation Qualification (Protocol / Report)
- Operational Qualification (Protocol / Report)
- Performance Qualification (Protocol / Report)
- System Qualification
 - Qualification Plan (Document)
 - Design Qualification (Protocol / Report)
 - Engineering Installation and Commissioning (Protocol / Report)
 - Installation Qualification (Protocol / Report)
 - Operational Qualification (Protocol / Report)
 - Performance Qualification (Protocol / Report)
- For these systems, it is necessary to undergo a third-party validation process where the contractor is responsible for the hiring expenses.
 - - HVAC System
 - Purified Water System
 - Compressed Dry Air System
- Ongoing validation activities;
 - Process Validation (Contractor observation only)
 - Test Method Validation (Contractor observation only)
 - Computer System Validation (Contractor scope until validation document report)
 - Routine Revalidation (Contractor observation only)
 - Prospective (Process) Validation (Contractor observation only)
 - Concurrent (Process) Validation (Contractor observation only)
 - Retrospective (Process) Validation (Contractor observation only)
 - Cleaning Validation (Contractor observation only)



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- Change Control (Contractor observation only)

Contractor to prepare Hazard analysis critical control point (HACCP) in comply with GMP Codex requirement.

- Initial Validation Master Plan
 - Initial Validation Master Plan refers to the Project Validation Master Plan, which is the overarching plan of the project from its inception to the completion of construction and delivery of the work.
- System Impact Assessment or System Classification
- User Requirement Specification
 - User Requirement Specification for machinery and systems that have an impact on product quality.
- Functional Design Specification and Detail Design Specification
 - It is necessary to conduct a meeting to ensure mutual understanding and define the scope of work for a subsequent delivery, once the contractor has been awarded the project.

2. Basic Engineering design data

2.1 Turndown capacity.

The unit shall be capable of a turndown minimum operable hydraulic capacity at 70% of design capacity while making on specification products.

2.2 Product Specifications

The Sodium Bicarbonate plant will produce Sodium Bicarbonate specifications as indicated in Annexure G.

2.3 Specific Process Design Guideline

- Contractor to design the utilities, process units and equipment to meet product specifications as per Annexure G.



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- Contractor to design basic engineering details as
 - Operating Conditions
 - Process Description
 - Block Flow Diagram
 - Process Flow Diagram
 - Equipment arrangement Plan
 - Equipment List
 - Specification of static equipment
 - Specification of Rotating Equipment
 - Specification of Package Units
- Process scheme shall include inbuilt facilities for safeguarding the process system in any type of emergency failure. Details of online analyzers required during operation shall also be furnished as necessary. (Recommended by Contractor/Licensor)
- Contractor to design future Liquid CO2 feed system (Flange Tie-In, reserve area for storage tank and evaporator).
- Contractor to design process water and steam specification to meet GMP requirement.
- IA/UA system shall equipped with Air buffer tank.
- Steam condensate shall equipped with condensate tank.
- Product packing units shall design for 25 Kg bags and 1 m3 bags specify in Annexure G
- Contractor to design in accordance with Owner’s project specification for Design Guideline PR-10-03 in Annexure I

2.4 Definition of Battery Limits

2.4.1 The all processing and utilities facilities as needed to meet the unit design objectives and guarantees, conforming to product specifications under Sodium bicarbonate plant battery limit shall be within the scope of Contractor/Licensor’s design/supply.



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2.4.2 CO2, Filtered Water supply, Fire water supply and Electrical power supply for the Sodium bicarbonate plant shall be made available from the existing Gas separation plant specify in Annexure M.

- CO2 Tie-in location
 - Condition at tie-in point;
 - Pressure 1 bara.



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Figure 2 Show tie-in location of CO2





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- Filtered water
 - Condition at tie in point;
 - Pressure 5 barg.

Figure 3 Show tie-in location of Filtered water



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- Firewater tie-in location
 - Condition at Tie-in;
 - Pipe Size 6 inches. (Underground)
 - Pressure 11.5 barg.

Figure 4 Show tie-in location of Fire water



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- Electrical power tie-in location



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- Electrical power supply will be supplied to existing main substation of GSP 6 plant.

Figure 4 Show tie-in location of Electrical power





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2.4.3 Storm water drainage tie-in location refer to figure 5

Note. The tie-in location at edge of SODANA fence. The exact location to be agree during execution.

Figure 5 Show tie-in location of Storm water drainage



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2.4.4 Waste Management system for Purge water and Drain and Drain/wash/Flush water (waste water collection pit or tank)



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include from the scope of Contractor/Licensor.

3. Technology License

Contractor shall provide/assign License for Sodium bicarbonate unit and providing the Owner the right for constructing, operating and maintaining the unit using Licensor’s technology. The technology should be commercially proven and capable of producing, as a minimum, desired requirement as indicated in this document.

Contractor shall select Licensor in the Licensor that can be produced Sodium Bicarbonate as per product specification Annexure G.

- Selected Licensor shall be able to provide the latest technology for Sodium Bicarbonate production to meet product specification as specified in this document.
- Licensor shall have the Representative and Technical Service in Thailand or South East Asia to ensure that the after service and troubleshooting will be efficient and convenience.
- Licensor shall have the at least 1 reference successful unit in commercial operation (at least 2 years operation) processing similar feedstock as specified in this document.

4. Scope of Work

4.1 Project Management

Contractor shall assign experienced project management team to act as Contractors technical and commercial liaison with Owner throughout the project.

Contractor shall submit project organization chart as minimum following positions in the proposal:

- Project Sponsor with a minimum of 10 years of experience
- Project Manager with a minimum of 10 years of experience
- Project Engineering Manager with a minimum of 10 years of experience
- Project Control (Schedule and Cost Control) with a minimum of 5 years of experience



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- Discipline Leads with a minimum of 5 years of experience
- Procurement Lead with a minimum of 5 years of experience
- Construction Manager with a minimum of 5 years of experience
- Site HSE Manage with a minimum of 5 years of experience
- Quality control manager with a minimum of 5 years of experience
- Project Manager with a minimum of 5 years of experience
- Civil Engineer with a minimum of 5 years of experience
- Mechanical Engineer with a minimum of 5 years of experience
- Piping Engineer with a minimum of 5 years of experience
- Electrical Engineer with a minimum of 5 years of experience
- Instrument Engineer with a minimum of 5 years of experience
- Process Engineer with a minimum of 10 years of experience

4.2 Engineering design package

4.2.1 The soil investigation and topographical survey at construction area responsible by Contractor.

4.2.2 The Engineering Design Package which will be prepared by the Contractor/Licenser shall contain adequate design data and information necessary to enable to proceed construction and commissioning of the unit. All documents are to be prepared in accordance with basis of design, Project specifications, colour code, nameplate, tag equipment number and code as per Owner standards.

4.2.3 Contractor shall ensure that the new facilities are functional and that the construction, operation, and maintenance of the Plant can be conducted safely, operability, ease of maintenance and efficiently at all times. New facilities do not adversely affect the operation, maintenance and safety of the Gas separation plants. Where practical, potential risks shall be mitigated at source and incorporated into the design.

4.2.4 Contractor shall identify the critical equipment list in which it shall be the equipment contributed the high consequence to plant operation on the aspects of operation constraint, economic, efficiency, health, safety and environment (HSE). All



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equipment in the critical equipment list shall be designed with the full reliability, completed spare or double machines.

4.2.5 Contractor is responsible for ensuring that all engineering, procurement and other documentation produced by Contractor is consistent in content, approach and numbering systems across the Project. Furthermore, Contractor is responsible for ensuring that all documents design performed by the Vendors and Subcontractors meet the requirements of the Project specification.

4.2.6 Contractor's design shall ensure the safety of personnel and equipment during operation and maintenance, in particular, safe starting, safe operation and safe shutdown of the plant shall be ensured at all times and under all conditions. Safe shutdown also includes those features required to ensure that safe conditions are maintained after the actual shutting down of part or all of the plant.

4.2.7 The principal International Codes and Standards to be used for this Project shall be of the latest edition/revision available at the time of the invitation to bid. In any deviations, Contractor shall clarify and be agreed by Owner before starting work. For more information of Project specification and standards, please refer Annexure I. Wherever Contractor/Licensor's own engineering standards are to be necessarily followed with respect to equipment design, piping design, instrumentation design, etc., the same shall be issued to Owner at no extra cost.

4.2.8 Technical information and process book shall be in English language. However some document may requires to submit to Thai authorities may require to translate to Thai language. SI system of units defined in Annexure B shall be used for all deliverables, items with the only exception being extended to Contractor/Licensor own standards which are issuable with their existing units of measurement.Note; All drawings (i.e. PFDs, P&IDs & Engineering Drawings) shall be made by the Contractor/ Licensor following the requirement as listed below:

- Develop all drawings based on various color codes and using AUTOCAD. Version of software shall be mutually agreed during KOM.
- Develop 3D Model based on various color codes and using Contractor's 3D design tool. Version of software shall be mutually agreed during KOM.
- All drawings to be given on tracing as well as in soft form.



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- All drawings shall be made in layer concept and not in single layer basis. All deliverable-native files shall be made available for Owner in final project record book.

4.2.9 Civil structural

- The site preparation shall be in accordance with Owner’s Specification for Specification for Site preparation ES-40.01.04.
- The Civil work shall design and construction in accordance with Owner’s Specification for civil work ES-40.01 in Annexure I.
- The Piling work shall design and construction in accordance with Owner’s Specification for Precast concrete Piling ES-40.01.01 and Cast in Situ concrete bored pile ES-40.01.02 in Annexure I.
- The Concrete foundations Structures & Paving shall design in accordance with Owner’s Specification Concrete foundations Structures & Paving ES-40.09 in Annexure I.
- The Steel structure work shall design in accordance with Owner’s General Specification for structural work ES-40.07 in Annexure I.
- The Steel structure Fabrication and Erection shall be in accordance with Owner’s General Specification for structural steel Fabrication & Erection ES-40.07 in Annexure I.
- The Architectural and Building design and construction shall be in accordance with Owner specification ES-40.03 Architectural materials and workmanship in Annexure I.
- The Road and Paving shall design and construction in accordance with Owner’s General Specification for Road and paving ES-40.12 in Annexure I.
- Drainage design and construction shall be in accordance with Owner’s General Specification for Drainage ES-40.13 in Annexure I.

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- Process building which needs openings to provide fluids, electricity and lighting. Access to the machine through doors or removable panels is also required for maintenance and servicing.
- In any case, that process building shall then be air tight to avoid mosquito penetration and have an efficient HVAC system if needed. Contractor to confirm HVAC system requirement.
- Contractor shall install the floors, walls, and doors to meet the requirements of the pharmaceutical compliance to GMP and PIC/s
- Buildings fire protection shall be in accordance with Owner Fire and Gas detection and protection specification ES-90.03 in Annexure I.
- Buildings Outline Drawings, Architectural Drawings and Details, and Steel Guide Drawings of the Building shall be proposed by Contractor to Owner during the detailed engineering activities.
- Clean room and storage area shall fully dedicated to packing function and dedicated to store the empty bags before they are used in the clean rooms.
- The cleanroom is a specific require a class 8 room as per ISO 14644-1 or a class D as per GMP EU classification. No deviation will be tolerated. Contractor to confirm HVAC system requirement.
- Warehouse building shall then be air tight to avoid mosquito penetration and have an efficient HVAC system if needed. Contractor to confirm floor material and HVAC system requirement.
- Warehouse will be designed for Palletizer equipment and levels racking storage system and around 170 ton/week will be loaded in to trucks.
- The partition walls shall provide to separate different grade product. Location of these will be submitted to Owner approval.
- The truck loading area will be equipped with the following;
 - 1 loading dock levelers,
 - 2 airtight industrial doors,
 - Warning lights (green, red) inside and outside.



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Technical data sheet of proposed material will be submitted to Owner approval.

- Logistic office, forklift parking area & battery charging area and Toilets as per Thai regulations.
- Contractor to provide fence for SODANA area. Fence shall same specification with existing GSP.
- Air conditioning and Mechanical ventilation shall consider for buildings ventilation to maintain air quality, temperature and air change rates to suit all building/rooms functions as per Thai regulations.
- The Single sheet roof panels, Single sheet wall panels, Roof and wall fasteners, Sealant and closures materials shall be met GMP requirement.

4.2.10 Mechanical

Mechanical equipment (CO2 Blower) will be installed in existing GSP(RTO plant) shall engineer, procure and construction in accordance with Owner’s engineering standard ES_20 Mechanical Equipment Static and ES_30 Mechanical Equipment Rotation and API 672 in Annexure I.

All Mechanical equipment that will engineer, procure and install in existing GSP shall be in accordance with Owners Engineering standard.

Contractor can engineer, procure and construction SODANA Mechanical equipment based on Contractor approved vendor list that suitable for GMP pharmaceutical manufacturing.

Contractor must take all necessary precautions to avoid that pieces of equipment are sources of any possible risk of contamination of the product by materials, lubricants, fragments of joints or external influences. Therefore,

- No bearings are allowed internally of the equipment. (bearings to be placed outside and penetration of oil or grease prevented)
- Materials, oil and grease must be of type for food applications (certificate to be delivered) or as specified.
- Joints must be of food grade quality (certificate to be delivered) and of white color.
- No product retention zones are allowed.



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- Equipment must be perfectly closed to avoid any possible contamination of the product from surroundings (air, water, grease or oil, ambient humidity etc.). Also no product leakage to the surroundings will be accepted.

The complete production facility will be qualified for Active Pharmaceutical Ingredients (API) production. All necessary documents to be delivered for project qualification file.

In general, all materials (included gaskets, grease, oil, adhesive etc.) for parts in contact with the product must be approved for food applications (certificates to be delivered).

- Allowed materials for parts in contact with the product;
 - Stainless steel of type AISI 304, AISI 304L or AISI 316L or FRP (glass fiber reinforced plastic) material with orthophthalic acid resin (cleaned and steamed inside before delivery - material in its finished state approved for use with foodstuffs according to FDA or EU-rule 2002/72/EC)
 - Joints: alimentary quality (certificate to be delivered) and white color if possible
 - Bolts and nuts: stainless steel
- Forbidden materials for parts in contact with the product;
 - Copper and its alloys
 - Aluminum and its alloys
 - Titanium alloyed metals
 - Zinc and its alloys
 - Painted or galvanized carbon steel
 - Materials and alloys containing heavy metals or regulated (ICH Q3D) class 1 & 2A elemental impurities (Arsenic, lead, mercury, Cadmium, Vanadium, Selenium and Cobalt)
 - Vitrified or enameled materials
- Oil and grease must be approved for food applications (certificate to be delivered).
- Glass must be approved for food application (certificate to be delivered).



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- Uses of regulated (ICH Q3D) class 2B & 3 elemental impurities (Silver, Gold, Thallium, Palladium, Platinum, Iridium, Osmium, Rhodium, Ruthenium, Antimony, Barium, Lithium, Tin) and derivatives in parts in contact with the products should be declared.
- Internal surfaces shall be absolutely smooth without sharp angles, protruding welds, cracks, pinhole etc.
- Stainless steel parts;
- All welds must be pickled and passivated
- Internal welds must be continuous and smoothed to avoid product retention
- Carbon steel (for parts not in contact with the product);
- Sandblasting SA 2.5 and painted (epoxy base paint for chemical industry; Dry Film Thickness: DFT ≥ 120 μm). Painting system to be proposed for Owner approval.
- Optional: hot galvanized
- All Equipment of process part should be;
 - All equipment must be conceived, dimensioned and used according to their intended use, cleaning and maintenance
 - All equipment must be conceived in such a way that parts in contact with the product do not affect the product quality
 - All equipment will be closed and tight in order to avoid any risk of contamination from the exterior.
 - All bolted assemblies subject to vibrations will be equipped with self-locking fasteners.
 - All inspection doors must be lockable (for instance with a padlock or bolted) in order to avoid unauthorized opening.
 - Angular sections are to be avoided; rounded or circular sections are preferred.
- Applicable codes for the equipment calculation and design: according to ASME code
- Flanges are also rated according to ASME code
- European machines will be according to EN standards.



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Equipment shall design in compliance with the latest design code requirements, and applicable standards/Specifications. All design calculations shall consider all loads for Erection, Operating and Hydro test conditions.

4.2.11 Piping

- Contractor to prepare new piping specifications meet GMP standard (i.e. Piping material, valves, Gaskets, pipe support etc.) for new fluid for Sodium carbonate plant for Owner approval before commence detail design.
- Piping stress analysis shall be in accordance with Owner specification ES-50.08 Specification for piping stress analysis in Annexure I.

Contractor can prepare and propose alternative project engineering specifications that suitable with GMP pharmaceutical manufacturing requirement for Owner approval if there is benefit to Owner.

- Piping, piping components material, piping design and installation for CO2 and all utilities that will tie-in from existing GSP6 shall in accordance with Owner Specification ES-50.02 , ES-50.01, ES-50.05, ES50-92, ES50-06 Specification for piping material in Annexure I.
- Contractor to design piping, welding, testing in the piping spool fabrication shop to minimize site work.
- Piping design shall consider;
 - Proper access to all operating points including valves and for all orifice fittings
 - Tapping points, instruments in particular
 - Proper access to inter-related operating points for specific purpose and for maintenance
- Contractor shall provide Utilities station (i.e. filtered water, utilities air etc.) and safety shower and eyes wash stations. The numbers and locations shall recommend by Contractor.
- Piping NDT inspection shall be in accordance with ASME Code & Standard
- Contractor shall conduct the welder examination in accordance with ES-96.51 Piping Construction by a government agency or a private company providing welding quality certification services to certify the test results (Third Party



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Certify only)

- Contractor shall prepare a Technical Inspection Procedure that has been certified by a juridical person with expertise in welding quality certification. The individual responsible for signing the work quality certificate shall hold international certification in accordance with recognized standards such as AWS, and the developed procedure shall be submitted to PTT for review and approval before commencing construction quality inspection work.
- Contractor shall carry out a Hydrostatic test after installing the pipes.
- All Tie-in points shall be constructed and installed according to the details provided in the attached document.
- Installation of Pipe Support & Pipe Shoe shall comply with ES-50.01 Att.1 Pipe support drawing.
- Cleaning and Flushing Line work shall be carried out in accordance with PR-10-31 Cleaning Line & Equipment, and the contractor shall prepare all necessary equipment and submit a Flushing Procedure to PTT for review and approval before commencing the Flushing process.
- Painting work shall comply with ES-92.06 PAINTING. The installation of scaffolding shall comply with ES-96.40 STANDARD SCAFFOLD EQUIPMENT.
- Pipe Marking work shall comply with ES-50.92 Marking for piping material.
- Small Bore Branch (Vent & Drain line) and Flat Bar installation for Small Bore Branch Gusset Pipe Support complies with ES-50.01 Piping Arrangement.
- Contractor shall install the bearing plate at the pipe according to the attachment.
- Break Class Pipe shall comply with ES 50.05 Att.2 PIPE BREAK CLASS.
- Contractor shall install High Point Vent and Low Point Drain.

4.2.12 Instrument

Contractor/Licenser to provide Instrumentation and Process control system and its associated item as per following;

Contractor can prepare and propose alternative project engineering specifications that suitable with GMP pharmaceutical manufacturing requirement

เนื่องจากข้อจำกัดของขนาดไฟล์แนบในระบบ

บริษัทที่สนใจเข้าร่วมประมูลสามารถขอรายละเอียดข้อกำหนดฉบับสมบูรณ์

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ภายในวันที่และเวลาที่กำหนดไว้บนหน้าประกาศ