



# Energy Efficiency Grant Call for Power Generation Companies

## CALL FOR PROPOSALS

Closing date for submission of proposals:

**1 Apr 2019, 5pm**

30 OCT 2018

ENERGY MARKET AUTHORITY  
991G Alexandra Road  
#02-29 Singapore 119975  
[www.ema.gov.sg](http://www.ema.gov.sg)

Please direct any enquiries to: [EMA\\_Enterprise\\_Development@ema.gov.sg](mailto:EMA_Enterprise_Development@ema.gov.sg)

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# **ENERGY EFFICIENCY GRANT CALL FOR POWER GENERATION COMPANIES**

## **1. BACKGROUND**

Over the years, the power sector has made efforts to manage our greenhouse gas emissions. This includes the switch from using petroleum products to natural gas as the main energy source for electricity generation, as well as investments in new and efficient Combined-Cycled Gas Turbines (“CCGTs”).

It is important that the power generation companies continue to improve their energy efficiency to adapt to an increasingly carbon-constrained future. To encourage further improvements to the power sector’s energy efficiency and to reduce its carbon emissions, the Energy Market Authority (“EMA”) is launching the Energy Efficiency Grant Call for Power Generation Companies (“Genco EE Grant Call”). EMA will co-fund the implementation of energy efficiency improvement projects proposed by the Gencos.

Gencos can engage their preferred original equipment manufacturers or vendors to conduct the energy efficiency projects. Gencos are also encouraged to tap on the Genco EE Grant Call early to invest in energy-efficient equipment or technologies to improve their competitiveness and maximise the accrued benefits.

## **2. OBJECTIVE OF GENCO ENERGY EFFICIENCY GRANT CALL**

The objective of the Grant Call is to encourage Gencos to invest in energy efficient equipment or technologies that can improve the overall generation efficiency of their existing CCGTs and reduce the carbon emissions for each unit of electricity generated.

## **3. GRANT QUANTUM AND SUPPORT RATE**

The total amount of grant support will correspond to the total amount of carbon abated. More energy efficient facilities or projects that achieve significant abatement levels may be eligible for more support, subject to a cap of 50 per cent of the qualifying costs.

All disbursements of grants are made on a reimbursement basis.

#### 4. QUALIFYING COSTS

The qualifying costs include the following:

- Manpower cost
- Equipment, technologies and materials
- Professional services (e.g. project management, detailed engineering, and measurement & verification)

Refer to Annex A for more details of the qualifying costs. Singapore GST is excluded.

#### 5. QUALIFYING PERIOD

Project must be completed within 36 months. Energy efficiency projects should commence no later than end-FY2023 to qualify for the grant call.

#### 6. ELIGIBILITY CRITERIA

##### **Company**

- Genco must be operating CCGTs in Singapore.
- Genco's CCGT to undergo energy-efficient project must be sited and operating in Singapore.
- This initiative applies to EE improvements for CCGTs and excludes embedded generation facilities.

##### **Project**

To qualify for the Genco EE Grant Call, the proposed energy efficiency project must meet the following criteria:

- The project must involve installation and use of energy-efficient equipment or technologies. These must improve overall generation efficiency and achieve carbon abatement, preferably with a proven track record.
- The project must result in measurable and verifiable carbon abatement of at least 0.5 kilo-tonnes per annum (ktpa). The project must not have commenced at the time of application.
- The project shall be completed within 36 months (3 years) from the agreed date of project implementation.

Examples of projects that qualify for the grant include, but are not limited to:

- Improved efficiency for auxiliary systems (e.g. gas compressor)
- Retrofits for CCGTs (e.g. Variable Speed Drives/Variable Frequency Drives for pumps/fans)

Projects that reduce cost, but which do not demonstrate measurable and verifiable improvement in generation efficiency and carbon abatement from the CCGTs, are not eligible. Examples of such projects include, but are not limited to:

- Energy efficiency solutions for non-electricity generation process (e.g. retrofitting utilities or lighting systems)
- Black box solutions (e.g. software or hardware devices whose functioning cannot be explained by applying mainstream engineering knowledge and theories, and where the efficiency improvement is not and/or cannot be established by objective measurement)
- Other project measures that are not permanently installed (e.g. plug-in equipment) or projects that result in negative environmental or health effects

## **7. MEASUREMENT AND VERIFICATION REQUIREMENT**

Gencos interested to apply for the grant should also include, as part of their proposal, a measurement and verification (M&V) plan. The M&V plan should state the method to measure, verify and compute improvements in energy efficiency and carbon abatement. The M&V plan and the results from the baseline measurement shall be in accordance with the International Performance Measurement & Verification Protocol or other equivalent international guidelines and codes. The M&V plan and baseline measurement should be endorsed by an independent Professional Engineer and the Genco, and submitted to EMA before the dismantling of existing equipment and/or systems. The baseline measurement shall be submitted to EMA after the in-principle approval of the Genco's proposal.

An M&V report stating the post-implementation measurement results and endorsed by a Professional Engineer in the same capacity must be submitted after completion of the project.

Both the baseline measurement and post-implementation measurement shall be witnessed by an independent Professional Engineer. He or she must not be involved in the project and must be registered with the Professional Engineers Board of Singapore under the field of Mechanical or Electrical Engineering. The measurement data shall be secured by the independent Professional Engineer who shall also report to EMA on how the baseline data was secured.

## 8. EVALUATION CRITERIA

The energy efficiency proposals will be evaluated based on the following areas:

### a. Potential gains in energy efficiency and carbon abatement

- i) Stretched and yet realistic carbon abatement targets (including the tonnes of carbon dioxide (“tCO<sub>2</sub>”) per year and total projected tCO<sub>2</sub> achievable throughout the lifespan of the CCGT)
- ii) Projected improvements in CCGT efficiency (%). Genco to provide evaluation of the CCGT’s efficiency before and after project completion.

### b. Feasibility of Implementation

- i) Detailed implementation proposal and timeline
- ii) Rigorous M&V plans that are in accordance to international protocols and standards as per Section 7
- iii) Comprehensive assessment of risk and mitigation measures (e.g. downtime of CCGTs)

### c. Project Cost

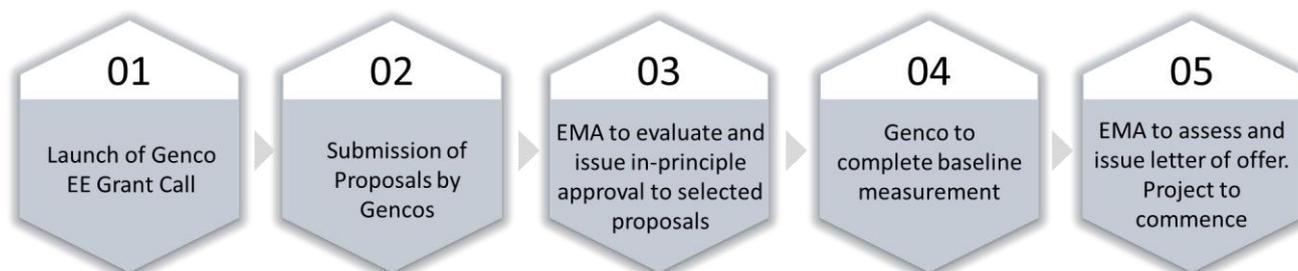
- i) Detailed cost breakdown and funding requirement
- ii) Assessment of the project payback period, before and after inclusion of requested grant amount

## 9. APPLICATION

EMA invites Gencos to submit proposals on implementing energy efficiency measures for co-funding support. The application window for the Genco EE Grant Call takes immediate effect until 1 April 2019.

EMA will evaluate the proposals based on the Eligibility and Evaluation Criteria stated above. Successful proposals which are accepted and approved by EMA can expect notification by Q4 2019. Awarded projects will commence thereafter.

A summary of the grant call process is shown below.



## **10. SUBMISSION**

Proposals should reach EMA by **5pm on 1 April 2019**. Please refer to Annex B for the project proposal template.

Proposals may be submitted via email to:  
[EMA\\_Enterprise\\_Development@ema.gov.sg](mailto:EMA_Enterprise_Development@ema.gov.sg)

## Annex A – Details of Qualifying Cost

<b>1.1 Manpower Cost</b>	
General Policy	<p>Actual qualifying costs for salary and/or training of qualifying personnel directly involved in the design and development of the Project. This does not include personnel employed for other job functions and/or job scopes outside of the Project. Qualifying personnel who are not involved in the project full-time may be supported, subject to pro-ration based on the time spent on the project.</p>
Cost of Living Adjustment (COLA) & Airfare	<p>Actual qualifying costs of COLA and Economy class airfare reasonably and prudently incurred for overseas trips by qualifying personnel and/or visiting experts directly involved in the design and development of the Project. Each visiting expert must be identified and his/her contribution to the project must be clearly defined and described in the proposal.</p> <p>COLA and airfare are non-supportable unless specifically provided for in the grant and approved by EMA. The above is provided said overseas trips are necessary for the Project. EMA may decline support for any overseas trip that it is of the view is unnecessary.</p> <p>The qualifying costs for COLA are costs incurred for room accommodation, meals and local transportation incurred during the overseas trip.</p>
Non-Supportable Items	<p>Manpower costs for equipment operators, and other personnel involved in the daily operations of the Genco facility, are not supportable. Staff retreats and support functions such as admin and finance are also not supportable</p> <p>All bonuses and allowances (e.g. transport, overtime, etc.) and the corresponding CPF except the AWS (subject to a cap of 1 month per calendar year) are not supportable, regardless of whether they are included under basic salaries for income tax purposes or any other purpose.</p> <p>Professional Membership Fees are non-supportable. This applies to Project Leaders as well as all staff funded from the grant.</p>

## **1.2 Equipment, Technologies and Materials**

General Policy	<p>Actual qualifying costs of equipment, technologies and material. The qualifying costs in this category are the purchase price or total lease payments of equipment, less any interest incurred, and any direct costs attributed to bringing the equipment to working condition.</p> <p>The purchase of equipment, technologies and materials is non-supportable unless specifically provided for in the grant approved by EMA.</p> <p>The procurement of such equipment, technologies and materials must be made according to the formal established and consistently applied policies of the Genco.</p> <p>The invoices for all claims must be dated before the end of the qualifying period.</p>
Non-Supportable Items	<p>Cost of capital works, general infrastructure, general purpose IT and communication equipment, office equipment, and furniture and fittings are not allowable under direct costs, unless specifically provided for in the grant and approved by EMA.</p> <p>Examples of such costs are computers, office productivity software, PDAs, mobile phones, photocopier machines, workstations, printers, etc.</p> <p>Overhead Expenses are also not allowable. This includes rental, utilities, facilities management, telephone charges, internet charges, etc.</p>

## **1.3 Professional Services**

General policy	<p>Actual qualifying costs of professional services specifically provided for in the grant and approved by EMA.</p> <p>The qualifying costs in this category are for consultancy, subcontracting, testing and certification required for the project. Costs incurred for the audit of claims (internal and external) are not supportable.</p> <p>All procurement of such services must be made according to the formal established and consistently applied policies of the Genco.</p>
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Non-Supportable Items	<ul style="list-style-type: none"><li>• Entertainment &amp; Refreshment</li><li>• Fines and Penalties</li><li>• Legal Fees</li><li>• Patent Application. This includes patent application filing, maintenance and other related cost.</li></ul>
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## Annex B – Project Proposal Template

<b>Project Title</b>	
<b>Project Description</b>	<p><b><u>Details of existing system</u></b></p> <ul style="list-style-type: none"> <li>- Specify the technical specification of the CCGT and/or relevant supporting equipment (including capacity of CCGT and/or equipment, age, remaining economic lifespan) before project implementation</li> <li>- Specify the CCGT’s usual operating conditions (e.g. average load factor, efficiency level, amount of fuel used per year, plant emission factor (tCO<sub>2</sub>/MWh) etc.)</li> <li>- Provide schematic of the existing system</li> </ul> <p><b><u>Details of the proposed system</u></b></p> <ul style="list-style-type: none"> <li>- Specify the technical specification of the CCGT and relevant supporting infrastructure (including age, size of system) after project implementation</li> <li>- Specify the projected CCGT’s new operating conditions (e.g. load factor, improved efficiency levels, amount of fuel used per year, plant emission factor (tCO<sub>2</sub>/MWh) etc.)</li> <li>- Specify the change in estimated lifespan of the proposed equipment/system (where applicable)</li> <li>- Explain how the proposed project works, and how it improves the efficiency of the existing CCGT</li> <li>- Provide relevant study report if feasibility study was carried out on the proposed project</li> <li>- Specify the targeted efficiency (%) and carbon abatement (tCO<sub>2</sub>) per annum of the CCGT after project implementation, including breakdown of efficiency at component level (if applicable)</li> <li>- Provide schematic of the proposed system</li> </ul>
<b>Project Timeline and Milestones</b>	<p><b>Provide <u>timeline of the key milestones</u> of the project including but not limited to the following:</b></p> <ul style="list-style-type: none"> <li>- Project commencement date</li> <li>- Baseline measurement</li> <li>- Installation/commissioning of equipment/technologies (if any)</li> <li>- Post-implementation measurement and verification</li> <li>- Project completion and submission of Final Report</li> </ul>

<b>Projected annual cost savings and carbon abatement from Project</b>	<p><b>Provide <u>estimated annual (i) cost savings and (ii) carbon abatement associated with the project</u></b></p> <ul style="list-style-type: none"> <li>- Provide <u>step-by-step</u> calculations on the annual cost savings and carbon abatement achievable from the project.</li> <li>- For the annual cost savings, savings from fuel cost and reduction in carbon tax (\$5/tCO<sub>2e</sub>) should be included.</li> <li>- List down all assumptions made in the above computation, including but not limited to: <ul style="list-style-type: none"> <li>o Estimated fuel cost and energy price</li> <li>o Remaining economic lifespan of CCGT</li> </ul> </li> </ul>
<b>Project Costs</b>	<p><b>Provide <u>detailed cost breakdown</u> of the following including <u>supporting quotations</u> for all cost components:</b></p> <ul style="list-style-type: none"> <li>- Manpower costs</li> <li>- Equipment, technologies and materials</li> <li>- Professional services (including details of professional's designation, experiences, manhours and unit costs) <sup>1</sup></li> </ul>
<b>Payback period</b>	<p><b>Genco should compute the payback period <u>before and after</u> receiving requested grant quantum using the formula:</b></p> <ul style="list-style-type: none"> <li>- Payback period (before Grant) = Project costs/ Annual projected cost savings</li> <li>- Payback period (after Grant) = (Project costs – Grants to be received) / Annual projected cost savings</li> </ul>
<b>Risk Assessment and Mitigation Plan</b>	<p>Provide project risk assessment and mitigation plans to reduce CCGT outage. Provide annual overhaul plans for all generation units for the year of project implementation.</p>
<b>Measurement and Verification Plans</b>	<p>Refer to Section 7 on the requirements for measurement and verification.</p>
<b>Project Leader/ Point-of Contact</b>	<p>Provide contact details of Project Leader/ Point-of Contact managing the project</p>

<sup>1</sup> Details should be provided in the following format:

Designation	Experiences	Manhours (hours)	Unit cost (\$/hour)	Total cost (\$)
e.g. Professional Engineer	e.g. 10 years	e.g. 50	e.g. 100	e.g. 5,000