# Application Guidelines for the Assessment and Accreditation of Energy Services Companies under the ESCO Accreditation Scheme

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# 1.0 Introduction

## 1.1 Need for Energy Services Company (ESCO) Accreditation

Energy efficiency development is well recognised as the main stay in enhancing the energy security, productivity and environmental sustainability of most economies, particularly developing economies. To ensure strong achievement in energy efficiency, a strong and vibrant energy services sector is a prerequisite. Hence, the energy service sector is a strategic and emerging sector with significant growth potential in Singapore and the region. The development of this sector serves to expand the general service sector, underpins economic development through enhancing cost competitiveness and at the same time strengthens Singapore's energy security and environmental sustainability.

The energy services sector is also a natural segment of the knowledge economy, providing sustainable environmental benefits. It paves the way for Singapore's development towards a developed economy.

For the purpose of this document, an ESCO is a company dedicated to the provision of energy efficient technology and services including financing, design, implementation and management of projects.

In this respect, an ESCO Accreditation System is an important market development measure for Singapore. The establishment of an accreditation scheme may lead to the following benefits:

- Development of professional and qualified ESCOs and energy engineers;
- Enhance the standing of ESCOs, and in particular energy auditing services;
- Support services procurement and selection procedures; and
- Support public sector incentive schemes in the promotion of energy efficiency.

## 1.2 Purpose of Guidelines

The aim is to establish clear and objective criteria for the assessment and accreditation of ESCOs. It serves to establish a Register of accredited ESCOs and enhance the professionalism of ESCOs' practices. This streamlines the procurement process and reduces overall tendering cost to clients who intend to engage such services.

These guidelines form part of a larger framework to accredit the full range of energy services. The overall objectives are to enhance professionalism and quality of services offered by ESCOs. This, in turn, leads to confidence in the energy services sector and hence promotes the growth of the sector.

## 2.0 Energy Audit

2.1 Definition of Energy Audit

An energy audit is carried out in a building or facility with the objective of improving its energy efficiency. It is an investigation involving a detailed analysis of energy flows into and out of a system. The aim is to identify and quantify those areas where improvements can be made and estimate the amount of savings achievable. These may include improvements to facility design and installation, operation and management.

Energy audit is commonly performed by ESCOs to improve the energy efficiency of a facility. Energy auditing plays a vital role in the success of any energy efficiency improvement project and/or energy performance contract (EPC).

There are several types and levels of energy audit performed by ESCOs. The general scope of work expected from ESCOs in performing different levels of energy audits work is described in the guidelines.

2.2 Scope of Work of Energy Audits

The various levels of energy audit commonly undertaken by ESCOs may be classified as follows:

2.2.1 Level I Audit - Preliminary or Walkthrough

Level I audit, sometimes referred to as preliminary audit, allows the overall energy consumption of the facility to be evaluated. It is expected to give an overview, providing a rough estimate of savings and costs.

This audit is usually designed to determine if the level of energy use of a facility has been reasonable or excessive. It provides initial baselines of the facility so that the effect of energy measures may be monitored and evaluated. It may or may not involve site visit. The information given to or gathered by the Auditor needs to be sufficient to enable the overall efficiency of the facility to be ascertained.

The scope of work for Level I audit is as follows:

- Gather facility wide energy use on a monthly and/or annual basis;
- Derive performance indicator;
- Broad conclusions and recommendations; and
- Written report.

2.2.2 Level II Audit - Standard

Level II audit identifies the source of energy to a facility, the amount supplied and what the energy is used for. It also identifies areas where savings may be achieved, recommends measures to be taken, and provides a statement of costs and potential savings. It also involves short term metering and logging.

The expected scope of work for Level II audit is as follows:

- Follow-up from Level I audit and report where available;
- Facility investigation;
- Detailed facility and systems' energy input and energy use;
- Reconciliation of energy accounts with loads;
- Variation on energy use on a month-to-month basis;
- Energy performance indicators;
- Recommend improvement work with indicative cost and saving;
- Implementation priority and plan;
- Align recommendations with client's energy program; and
- Written report and presentation.

2.2.3 Level III Audit – Comprehensive or Detailed

Level III audit provides a detailed analysis of energy usage, the savings that can be made, and the cost of achieving those savings. It may cover the whole facility or may concentrate on an individual item and/or system, such as a single industrial process or one of the services. It also involves long term detailed metering and data logging.

The expected scope of work for Level III audit is as follows:

- Follow-up from Level II audit and report where available;
- Define facility / process audited;
- Facility / process investigation and detailed measurements;
- Detailed metering down to half-hourly time interval where required;
- Derive target energy use and develop baseline model where relevant;
- Detailed recommendations including costs, savings and accuracy of estimates;
- Detailed investment plan;
- Suggest refinement to energy policy and energy program; and
- Written report and presentation.

An energy audit carried out for Operating System Efficiency is not considered as a Level III energy audit.

2.2.4 Documentation

All energy audit reports and subsequent implementation reports shall be prepared in accordance with requirements specified by established international standards and codes. References shall be made but not limited to the following documents for this purpose:

- AS/NZS 3598:2000 – Energy Audits;
- ASHRAE RP-669, SP-56: 2004 – Procedures for Commercial Building Energy Audits;
- CIBSE TM22:1999 – Energy Assessment and Reporting Methodology; and
- Other equivalent international standards and codes.

A guideline for energy audit reports is available at www.e2singapore.gov.sg for reference.

## 3.0 Type and Coverage of Accreditation

The Applicant may seek to obtain accreditation for Level III energy audit and/or implementation of energy efficiency projects under the following categories:

- Building: For whole building audit.
- Industry: For specific industry sub-sector or industrial facility. Examples include Refineries, Petrochemicals, Pharmaceuticals, Etc.
- System/Process: For specific system, component or process audit. Examples include Centralised Chilled Water System (space/process cooling) / AHUs and FCUs / Lighting / Ventilation / Compressed Air / Boiler / Pumping / Power Generation / Etc.

## 4.0 Requirements for Accreditation

4.1 Full Accreditation – Existing ESCO (in operation for more than 3 years)

To qualify for accreditation, the ESCO must comply with the following requirements:

1) The Applicant shall have completed a minimum of 9 energy audits at Level III according to *Section 2.2* and a minimum of 3 implementation projects within the past three years;

2) The Applicant shall have under its full-time employment a minimum of 1 Qualified Energy Services Specialist (QuESS), as defined in *Section 5.5.1*, as the main person to oversee, manage and carry out energy services work; and

3) The Applicant shall be equipped with calibrated measuring equipment and instrumentation to carry out energy audit, as described in *Section 5.5.2*.

During the period of accreditation, if there is no full-time QuESS in the company, the Company's information will be removed from the register of accredited ESCOs till further notification by the company.

It is the full responsibility of the accredited ESCO to promptly notify the NEA and BCA of any change within the company with respect to the details and/or presence of QuESS within the company.

4.2 Provisional Accreditation - Newly Formed ESCO (In operation for less than 3 years)

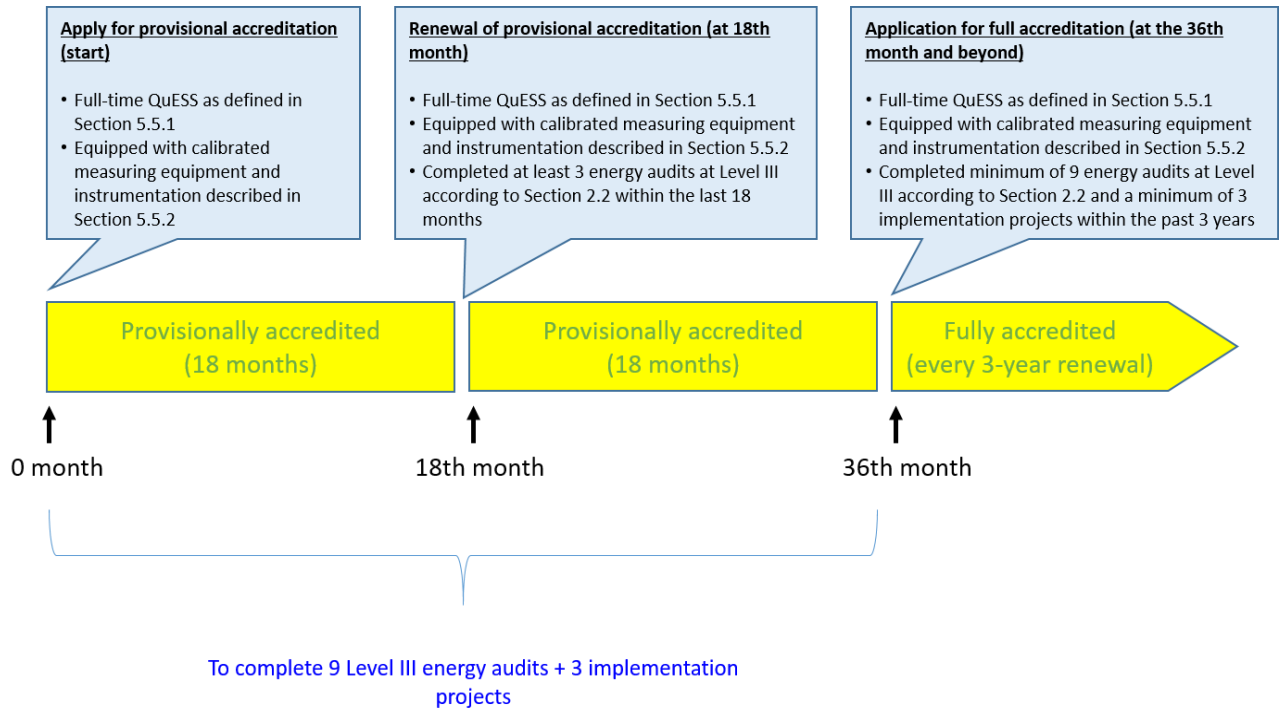
1) The Applicant shall have under its full-time employment a minimum of 1 Qualified Energy Services Specialist (QuESS), as defined in *Section*

*5.5.1*, as the main person to oversee, manage and carry out energy services work; and

2) The Applicant shall be equipped with calibrated measuring equipment and instrumentation to carry out energy audit, as described in *Section 5.5.2*.

The Applicant may be provisionally accredited for 18 months, up to a maximum period of 3 years, whereupon full accreditation shall be sought. For renewal of provisional accreditation (i.e. 18 months after first accreditation), the Applicant has to complete 3 energy audits at Level III according to *Section 2.2*.

Full accreditation may be granted after the Applicant has successfully met the full requirements upon the completion of 3 years of operation / provisional accreditation. The diagram below shows how ideally a provisionally accredited ESCO could progress towards full accreditation.




## 5.0 Application and Assessment

### 5.1 Scope of Accreditation

The accreditation scheme as outlined in this document shall apply to the provision of energy auditing services by an ESCO with respect to Level III energy audit. The classification and the respective scope of work are as described in *Section 2.2*.

This accreditation shall be assessed on the Applicant's expertise, capability and track records in the respective sector(s) of industry and category as indicated in the application, as well as the qualifications and experience of the nominated QuESS.

5.2 Conditions for Accreditation

An Applicant, in submitting an application, is deemed to acknowledge that the sole basis of such an application is the submitted document.

Applicant is advised to thoroughly read and check the guidelines before submitting an application. **A full and complete submission with all the required details and relevant documents must be submitted.** The Accreditation Committee shall not evaluate any partial and incomplete submission, including failure to submit the necessary documents required.

New and renewal application shall be made on a voluntary basis. In any case where renewal is not completed prior to the expiry of the accredited period, the company's information may be removed from the registered list until further action by the company has been taken to secure accreditation.

NEA and BCA accept no responsibility for any expenses, loss or damage which may arise from the evaluation process, interpretations and preparation made by the Applicant including the information contained therein, or omission from the submitted documents.

5.3 Accreditation Criteria and Assessment Procedures

Upon the receipt of an Application, an assessment will be made to determine the level of compliance with respect to the established guidelines. Applications will be assessed on the basis of the information submitted.

A flow diagram showing the assessment procedure is given in ***Annex 1*****.**

5.4 General Accreditation Assessment Criteria

The general assessment criteria are as follows:

i) Performance records on the following aspects of energy efficiency audit/assessment, management and EPC projects:

- Building / facility energy audits or assessments
- Energy measurement and verification protocols
- Installation and project management
- Post-Implementation report of completed projects
- Records of energy saving achieved (against guaranteed saving where relevant)

ii) Detailed company work profile.

iii) An acceptable organizational structure and legal entity.

iv) Applicant must be solvent and be backed by sound technical organization.

v) Reference letters from 3 or more clients whose projects/contracts have been sited in the company/QuESS' track records.

5.5 Technical Capability Assessment

5.5.1 Personnel Technical Competency

For the purpose of this accreditation, the criterion of technical competency of the Applicant is measured in terms of personnel competency. The technically qualified person shall be called the "Qualified Energy Services Specialist (QuESS)". The QuESS must meet all of the following criteria:

(1) Person having a **relevant engineering degree** and has completed at least **3 Level III energy audits** within the last three years; and

(2a) Person having a relevant professional qualification (such as USA Association of Energy Engineers' Certified Energy Manager, Australian Institute of Refrigeration, Air-conditioning and Heating Inc's Registered Energy Auditor, ECCJ of Japan Certified Energy Manager) and has two years of post-certification experience under an established certification or accreditation system, or

(2b) Person having been certified as **Singapore Certified Energy Manager (SCEM)**.

(3) Under all the above categories, person seeking QuESS accreditation must submit detailed documentary evidence and reports clearly identifying the work and experience of the candidate concerned. In the event where the Accreditation Committee is unable to ascertain the full qualification and/or experience of the candidate, an interview shall be called at a later date.

(4) New QuESS applicants are required to submit a 2000-word technical competency report for the Accreditation Committee to assess their technical ability.

5.5.2 System and Equipment Set-Up

In order to assess the Applicant's adequacy in providing a comprehensive energy audit at Level III, the Applicant must provide a list of equipment / instrumentation available for such work, including the photographs and specifications of these equipment. The applicant shall also provide details on the status of equipment accuracy and calibration.

For this requirement, the Applicant may be equipped with, but not limited to, the following equipment and instruments to carry out detailed energy audit and collect the required field data according to *Section 2.0* above:

1) Energy Meter
2) Power Transducer
3) Data Logger
4) Ultrasonic Flowmeter
5) Power Quality Analyser
6) Current / Voltage Clamp Meter
7) Pressure Indicator / Probe / Sensor

8) Temperature Indicator / Probe / Sensor
9) Humidity Level Indicator / Sensor

As for the calibration of equipment, Applicant shall provide information on standard / reference adopted either through Manufacturer / Supplier's guidelines / manual or Third Party independent certification.

**The requirements on the frequency of calibration of equipment / instrumentation are as follows:**

| **Instrumentation** | **Frequency of calibration** |
|---|---|
| Thermistor<br>Flow meter<br>Power meter | Yearly |
| All other instrumentation | Depending on the validity of the calibration certificate |

Applicant should also provide information with respect to the use of energy simulation software or programmes, especially for Level III energy audit.

## 6.0 Submission of Application

6.1 When submitting application for accreditation, the Applicant must complete and submit the following:

- A completed Application form
- QuESS Information form
- A completed form listing successfully completed Energy Auditing projects. This should include detailed reports, outcomes or results of projects, and clients' endorsement/reference letters bearing the appropriate letter head and name and designation of signatory.
- A completed form listing Equipment and Instruments used.
- Provide all relevant information requested as listed in ***Annex 2 to 5*** herein.

The completed forms and documents are to be emailed to:

Eunice_Koh@nea.gov.sg and Rabeeah_Sheik_Mohamed_Ismail@nea.gov.sg

The sample copy of relevant forms and templates for the preparation of the application are given in ***Annexes 2 to 5*** of the Guidelines.

The forms are available from the ESCO Accreditation Scheme website.

6.2 Acceptance of Application for Accreditation

Application will be evaluated against the stipulated criteria as set out in *Section 5.0*.

6.3 Issuance of Accreditation Certificate

Accreditation certificate will be issued upon successful application. The accredited ESCO will also be registered on a list of accredited companies for auditing services and posted on the official ESCO Accreditation Scheme website. There is no certificate for QuESS. The QuESS will be registered on a list of QuESS on the official ESCO Accreditation Scheme website.

6.4 Accreditation Renewal

A provisional accreditation and full accreditation award shall be valid for a period of 1.5 year and 3 years respectively, whereupon a renewal application shall be submitted with the relevant documentation, otherwise the accreditation shall deem to have lapsed.

6.5 Confidentiality

All materials and information submitted with the application will be held in strict confidence and will be used for assessment purposes only. By applying for ESCO Accreditation and QuESS, Applicant allows and authorises the sharing of submitted information and documents amongst and within the ESCO Accreditation Committee.

6.6 Code of Practice / Conduct

The successful Applicants including the QuESS which achieved accreditation shall conduct their business in a professional and ethical manner according to the relevant government laws and regulations.

An accredited company may have the accreditation withdrawn or suspended for the following reasons:

- failure to complete any EPC or energy audit work;
- received complaint(s) lodged by Client(s) for consistently delivering poor quality work;
- financially insolvent;
- malpractice and/or fraud;
- major change to the company structure and/or personnel;
- submitted misrepresented information;
- no QuESS in the Company.

The Accreditation Committee has the right to remove an accredited company from the register; or temporary suspend any member on the register for a period deemed appropriate.

6.7 Obligation and Additional Requirements from accredited ESCOs

An accredited company shall be obliged to inform NEA of any major change in the company. Such major changes may involve the company's ownership, financial status, structure, and/or movement of its QuESS, within a period of one month. Failure to do so may result in the suspension of the company from the Register of the accredited ESCOs.

6.8 Register of Accredited ESCOs

The Register of Accredited ESCOs will be made public and available for use by various private and public organizations and agencies in selecting and engaging ESCOs to submit proposal for particular energy efficiency work or project.

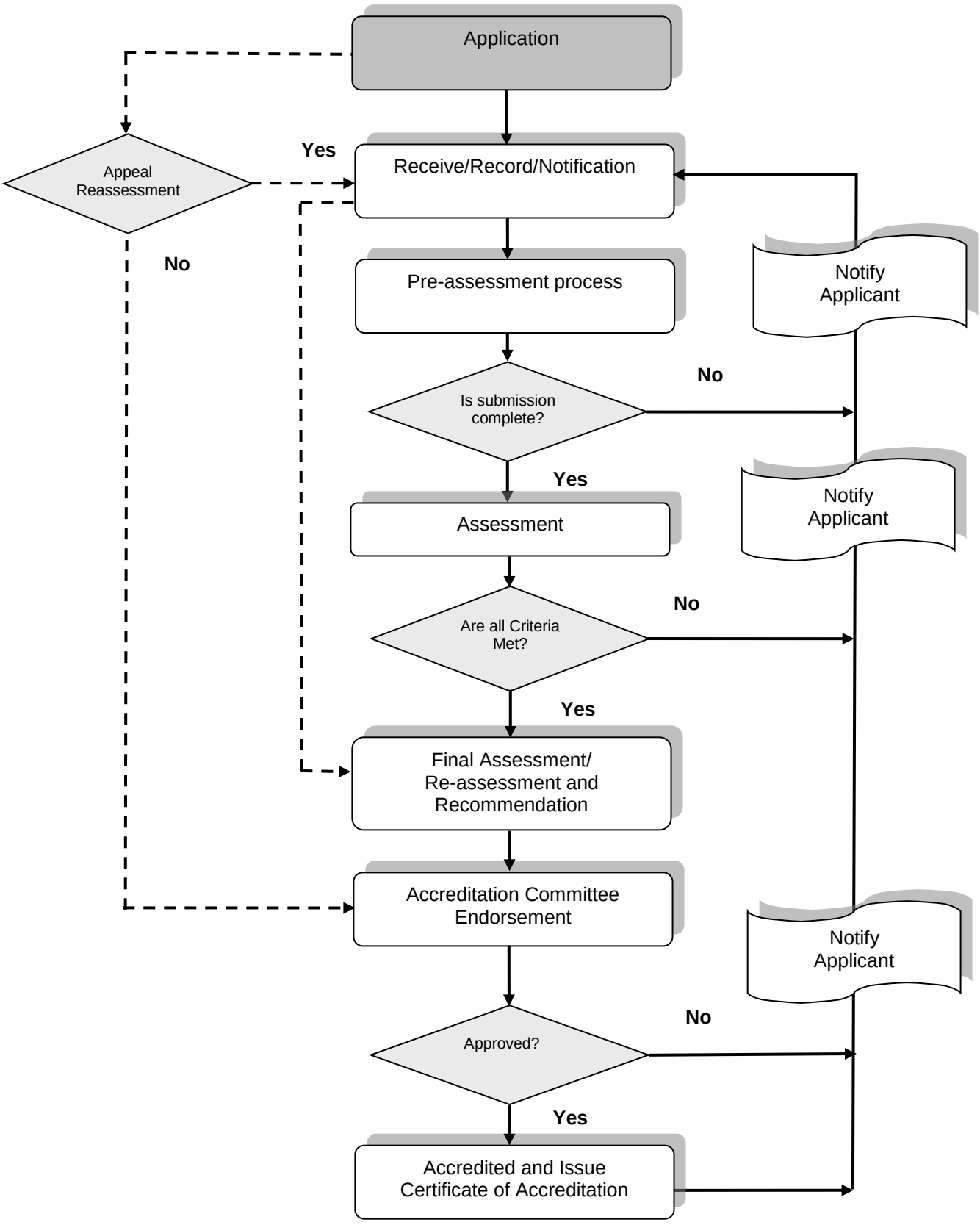
## 7.0 Further Information

Any inquiry or clarification with respect to an application must be made via email to NEA at the same address as for the submission of application.

# ANNEXES

## Assessment Procedure Flow Chart

**ANNEX 1**



**ANNEX 2**

# APPLICATION FOR ACCREDITATION OF ENERGY SERVICES COMPANY

Please read the Application Guidelines before completing this form. **A full and complete submission with all the required details and relevant documents must be submitted.** The Accreditation Committee shall not evaluate any partial and incomplete submission, including failure to submit the necessary documents required.

All applications shall be made on a voluntary basis. In any case where renewal is not completed prior to the expiry of the accredited period, the company's information may be removed from the registered list until further action by the company has been taken to secure accreditation.

Email the completed Application Form and other related documents to:
Eunice_Koh@nea.gov.sg and Rabeeah_Sheik_Mohamed_Ismail@nea.gov.sg.

**All information and documents submitted will be kept confidential.** By applying for ESCO Accreditation and QuESS, Applicant allows and authorises the sharing of submitted information and documents amongst and within the ESCO Accreditation Committee.

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## General Information

Purpose: New Application / Renewal *
Type: Full / Provisional *

* Pls delete whichever is unnecessary.

Name of ESCO:
Date of Incorporation:
Business Address:
Tel No.:
Email:
Website:

Registered QuESS:
Name of contact:
Tel No.:
Email:

Accreditation for Type(s): Buildings / Industrial / Systems e.g. Centralised Chilled Water System (space/process cooling) / AHUs and FCUs / Lighting / Ventilation / Compressed Air / Boiler / Pumping / Power Generation / Etc (Please specify)

## Other information to be Submitted

- Annex 3 listing the level III energy audits and/or implementation projects completed by the company
    - For new or renewal applications of Full Accreditation, the company shall submit at least 9 energy audit reports and 3 implementation projects where the energy savings are measured and verified. The

energy audits and implementation reports must be completed within the past 3 years.
    - For renewal of Provisional Accreditation, the company shall submit at least 3 energy audit reports. The energy audits must be completed within the past 1 year.
- Annex 4 – List of Equipment and Instruments Form
- Annex 5 – Qualified Energy Services Specialist (QuESS) Application/Information Form
- Organisational structure of company showing details of Director/s, Partner/s, Manager/s and Senior Staff providing names, position, qualification, experience and other firms with whom they are currently associated
- A copy of the ACRA business profile
- Audited annual financial (profit and loss) statements and balance sheet for the last two years and certified statement of capital net worth
- 3 customer references from past projects, including cost and cost savings achieved (against guaranteed saving)

**Declaration**

1. I, the undersigned, hereby apply for the accreditation as an accredited Energy Services Company with NEA and BCA and certify that, to the best of my knowledge, the particulars given in this application and all accompanying documents/declarations are true and correct.

2. I hereby authorise NEA and BCA to make direct enquiries and references to any person, firm, public officer or organisation named in the application to verify the information submitted herein or relating to the competence and general reputation of my organisation.

3. I will make my representative or myself available to be interviewed as and when required by NEA and BCA at a time agreed by both parties with respect to my application for accreditation.

4. I have clearly indicated that all information rendered is to be treated in the strictest confidence.

5. I further agree that in the event that my organisation is found to be in breach of any code of conduct/practice, NEA and BCA reserve the right to either suspend or withdraw my accreditation from the Register for a period determined by NEA and BCA.

| | |
|---|---|
| _____ | _____ |
| Signature of Authorised Person | Name of Company and Stamp |
| _____ | _____ |
| Authorized Person's Full Name | Designation |
| _____ | |

Date

| | |
|---|---|
| _____ | _____ |
| Signature of Witness | Name of Company and Stamp |
| _____ | _____ |
| Witness' Full Name | Designation |
| _____ | |
| Date | |

**ANNEX 3**

## LIST OF ENERGY AUDITING AND/OR IMPLEMENTATION PROJECTS COMPLETED BY THE COMPANY

| | **Project Title & QuESS Assigned** | **Name of Client Address & Contact Info** | **Year of Completion** | **Project Cost (S$)** | **Achieved/Estimated* Savings** | | **Detailed Audit Report / Attachment** |
|---|---|---|---|---|---|---|---|
| *Eg.* | *Chiller plant retrofit / Dr. XXX* | *XXX Pte Ltd Address / Tel no.* | *2017* | *S$1000,000* | *S$200,000 (Act.)* | *10% of chiller plant consumption* | *Detailed audit report attached* |
| 1 | | | | | | | |
| 2 | | | | | | | |
| 3 | | | | | | | |
| 4 | | | | | | | |
| 5 | | | | | | | |

**Note:** Add rows as necessary. *Indicate Achieved or Estimated Savings.

**ANNEX 4**

## LIST OF EQUIPMENT AND INSTRUMENT

| No. | Description of Equipment | Model & Brand | Type | Accuracy | Year Purchased | Country of Origin | Status of Calibration (Year last Calibrated ) | Documents/ Calibration certificates |
|---|---|---|---|---|---|---|---|---|
| *Eg.* | *Ultrasonic Flowmeter* | *ADM6725 / FLUXUS®* | *Portable, Clamp On, 2 Channel* | *± 2%* | *2016* | *UK* | *2017* | *Equipment Manual* |
| 1 | | | | | | | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |

**Note:** Add rows as necessary.

**ANNEX 5**

## QUALIFIED ENERGY SERVICES SPECIALIST (QuESS) APPLICATION/INFORMATION FORM

The Company shall indicate the qualification of key personnel who will be responsible for the energy auditing and implementation projects for the Company.

### Other information to be submitted

- Certified true copy of academic and other relevant certificates
- Certified true copy of professional membership / technical associations certificates
- Three original Client's reference letter from the list of completed projects. The client's references should include information such as role and responsibility of QuESS, actual savings achieved, payback period and whether they are satisfied with the services rendered by the QuESS etc. These letters should be printed with the client's company letterhead and signed by the client's authorised person.
- At least three detailed energy audit reports on the projects listed.
- All new QuESS applicants are required to submit Part 2 – Technical Competency Report.

**Note:**
Each work / project should not be listed by more than one QuESS.

**Part 1 – Personal Information**

Name:
Date of Birth: Age:
NRIC / EP No.: Nationality:
Designation:
Contact No.: (Office) (Mobile)
Email:

Academic Qualification
1.
2.
3.

Other Qualification on Energy (if any)
1.
2.
3.

Membership of Professional and/or Technical Associations
1.
2.

**Employment Record** Name of Nominated QuESS: _____

| Period From / Till | Name of Company | Position Held | Responsibilities and Experience |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

**Previous and Current Project Works** Name of Nominated QuESS:

| Project Period From / Till | Project Title & Site Location | Name of Client Address & Contact Info | Scope of Work, Role and Responsibilities | Status of Project |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

**Note:** Add rows as necessary.

## Part 2 – Technical Competency Report

**Applicants are required to submit a 2000-word technical competency report which should demonstrate the applicant's ability in the following areas:**

- Evaluation of energy performance of energy consuming systems (e.g. chilled water, lighting, compressed air or heating systems)

Click to add text

- Identification of energy efficiency opportunities via theoretical and practical methods, including any creative / innovative approach used to improve energy efficiency of a system/facility

Click to add text

- Technical and cost-benefit analysis of energy efficiency improvement recommendations

Click to add text

- Planning and execution of projects: organizing or performing technical work to implement or validate solutions and designs (i.e. M&V application, data analysis)

Click to add text

- Combining ideas and contributions of different people and disciplines to arrive at appropriate engineering and technical solutions – *optional*

Click to add text