

**EENP
AWARDS
2020**



INDUSTRIAL ENERGY EFFICIENCY
SHARING SESSION

Energy Efficiency Fund (E2F)

Chang Xiu Juan, Executive Engineer



Organised by:



An Initiative by:



In Support of:



Held in:





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INDUSTRIAL ENERGY EFFICIENCY
SHARING SESSION

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1 Energy Efficiency Fund (E2F)



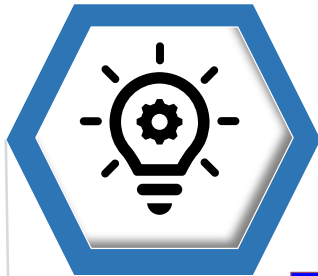
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Energy Efficiency Fund (E2F)

Energy Assessment

Up to 50% of qualifying costs, capped at \$200,000 over a 5-year period



UPDATE

Energy Efficient Technologies

Up to 50% of investment cost for EE Technologies

Energy Management Information System (EMIS)

Up to 50% for implementing EMIS, capped at \$250k for energy-intensive facilities (annual energy consumption >54TJ) and \$125k for other facilities



Resource Efficient Design

Up to 50% of qualifying costs, capped at \$600,000 for design workshops



Climate-friendly refrigerants for chillers

Details to be released

NEW



Energy Assessment

DETAILS



Objective

Encourage companies in the industry sector to carry out energy assessments for their existing facilities to identify potential areas for energy efficiency improvement

Note: Energy assessments of relevant business activities of registered corporations under the Energy Conservation Act are not eligible for application from 1 Jan 2020.



Form of Assistance

Up to 50% of qualifying costs, capped at \$200,000 over a 5-year period for any single facility

- Consultancy fees
- Instrument and Evaluation Tools

GST is excluded and cost of implementing recommendations is not supported under this component



Eligibility

- Owner / operator registered in SG
- Industrial facility sited in SG
- Companies must have conducted a preliminary energy assessment at the time of application, but have not commenced detail energy assessment
- Companies have to engage an energy consultant who could be:
 - Accredited under NEA's ESCO Accreditation Scheme; or
 - Experienced internal assessment teams with good track record in carrying out projects of comparable scale/scope



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Energy Assessment

SUCCESS STORIES



Molex Singapore Pte Ltd

Implemented measures identified during the energy assessment. Measures include chiller optimization, installation of VSDs on pumps, retrofitting air compressors and rectifying leaks.

Achieved 2,475 MWh of energy savings annually or \$628,000



Systems on Silicon Manufacturing Company Pte Ltd

Implemented measures identified during the energy assessment. Measures include installation of controller and chiller system optimization.

Achieved 2,500 MWh of energy savings annually or \$319,000



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Energy Efficient Technologies

DETAILS



Objective

Encourage manufacturing companies to invest in energy efficient equipment or technologies



Form of Assistance

Up to 50% of qualifying costs

- External manpower
- Equipment or technology; and
- Professional services

GST is excluded



Eligibility

- For Singapore-registered owner/operator of manufacturing company (SSIC code 10XXX to 32XXX)
- Industrial facility sited in SG
- Annual group sales turnover \leq S\$500mil*

* Manufacturing companies with annual group sales turnover $>$ S\$500mil are supported under EDB's Resource Efficiency Grant



Energy Efficient Technologies



- Project must involve installation of EE equipment with proven track record of energy savings in industrial facility
 - Project must result in measurable and verifiable energy savings
 - Project must not have commenced before the application is approved
 - Project must be completed within 36 months from application approval
- Note: Commencement refers to signing of contract(s) or issuing of purchase order(s)*

| Examples of Eligible Projects | Examples of Non-eligible Projects |
|---|--|
| <ul style="list-style-type: none"> ✓ LED lamps ✓ IE4 or better motors ✓ 4 ticks or better air-cons* ✓ Central chilled water systems ✓ Compressed air systems (including dryers) ✓ Heating systems (e.g. boilers, ovens, furnaces) | <ul style="list-style-type: none"> × Power conditioning projects × Black box solutions × Load-shifting/load-management measures × Solar PV installation × Measures that are not permanently installed (plug-in equipment) × Projects that result in negative environmental or health effects |

* Inclusion of VRFs to be effective from Q4 2020 (tentative)



Energy Efficient Technologies



M&V Requirements

- M&V to be conducted before and after the replacement/upgrade
 - Termed “Baseline M&V” and “Post-implementation M&V”
- Shall be witnessed by NEA and third party qualified personnel
- No M&V required for LED, 4-tick or better air-con, IE4 or better motor

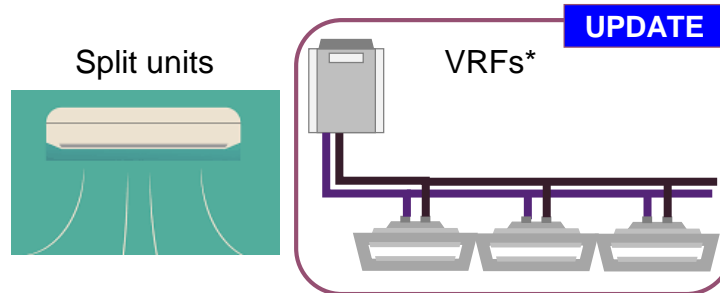
LED Lighting (without lighting controls)



- Efficacy of at least 100 lumens/watt

+Tentative

Air-conditioners



*Effective from Q4 2020+

- Listed as 4/5-tick under NEA’s Energy Labelling Scheme

Motors



- Registered as IE4 and above under NEA’s Minimum Energy Performance Standard



Typical payback periods:

LED Lamps



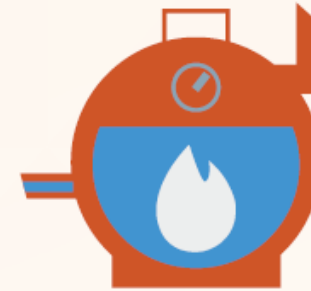
~ 3 Years

Central Chilled
Water Systems



~ 4.5 Years

Heat
Recovery System



~ 3.5 Years

Every \$1+ invested in energy efficient technologies has a return in energy savings ranging from \$2 to \$4

+ Only applicable to lighting, chilled water, heat recovery, combined heat and power systems



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Energy Efficient Technologies (EET)

SUCCESS STORIES

SUCCESS STORY



Maxsteel Enterprise
Pte Ltd

Maxsteel Enterprise Pte Ltd

Replaced 67 nos. of metal halide high lamps and 8 nos. of high pressure sodium lamps with LED.

Reduction in lighting energy consumption by 53% and annual savings of 22MWh or \$3,300.

SUCCESS STORY



Nordic Group Limited

Nordic Group Limited

Installed 705 nos. of LED lamps and 50 nos. of 4-tick air-conditioners.

Reduction in energy consumption by more than 35% with at least 20% savings in dollar value.



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NEW



Energy Management Information Systems (EMIS)

DETAILS



Objective

Encourage companies to put in place an EMIS which would enable them to effectively manage energy use in a structured manner to achieve efficiency improvements



Form of Assistance

Up to 50% of qualifying costs, capped at \$250,000 per energy-intensive facility (i.e. consume ≥ 54 TJ of energy annually) and \$125,000 per facility for other facilities

- Equipment and Materials[^]
 - instruments, data transmission and storage systems, other related hardware and systems
- Professional services
 - engineering and design, programming, guidance on use, training, commissioning support etc. rendered for implementation of EMIS
- Software and IT services for detailed design and implementation of EMIS
 - software licensing, cloud-based services (up to 1 year)

GST is excluded



Eligibility

- SG registered owner/operator of industrial facility sited or to be sited in SG
- Project must not have commenced at time of grant application
- Only energy management-related functions are supportable
- EMIS shall be commissioned within 2 years from grant approval

Note: Commencement refers to signing of contract(s) or issuing of purchase order(s)



Energy Management Information Systems (EMIS)

PROJECT REQUIREMENTS



Scope

EMIS should cover all significant energy-consuming systems / energy streams

Otherwise, justifications to be provided for consideration



EMIS Supplier /
Consultant

EMIS vendor/ supplier/ consultant must demonstrate good track record in implementing EMIS of similar scale and scope



Project Features

- (a) Tracking and Monitoring
- (b) Reporting
- (c) Alerts
- (d) Data capture and storage
- (e) Data analysis



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Resource Efficient Design

DETAILS



Objective

Encourage investors in industrial facilities in Singapore to integrate energy and resource efficiency improvements into manufacturing development plans early in the design stage



Form of Assistance

Up to 50% of qualifying costs, capped at \$600,000

- Consultancy fees
- Transport & accommodation for consultants
- Venue & logistical costs for workshop
- GST is excluded



Eligibility

- Owner / operator registered in SG
- New* industrial facility / existing facility to undergo major expansion sited in SG
- Detailed design of facility not commenced at time of application
- Energy consultant able to show good track record in carrying out design workshops of a comparable scale and scope

* New facilities with estimated annual energy consumption of at least 54TJ, and whose planning permission are not obtained on or after 1 Oct 2018 are not eligible for application



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Resource Efficient Design

DETAILS

What is a design workshop?

- Intensive 2- to 3-day session
- Bringing together multi-disciplinary internal & external experts at design stage
- Identify technical opportunities to improve resource efficiency (e.g. energy water)



* New facilities with estimated annual energy consumption of at least 54TJ, and whose planning permission are not obtained on or after 1 Oct 2018 are not eligible for application



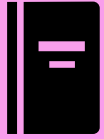
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2 Energy Efficiency Technology Centre (EETC)

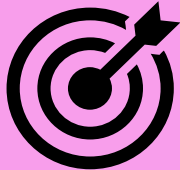


Energy Efficient Technology Centre (EETC)



Background

- Collaboration between NEA and SIT
- Officially operational on 16 Jun 2020
- Headed by Er. Prof. Lock Kai Sang of SIT



Objectives

- Applied Research – Build capability for SMEs by supporting SMEs in energy assessments and energy efficiency related applied research projects
- Continuous Education and Training – Upskill industry professionals in industrial energy efficiency
- Talent Pipeline - Train students on energy efficiency through applied learning programme in EETC

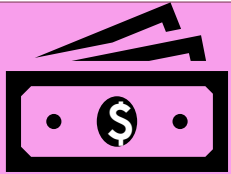


Benefits

- Participating SMEs will receive a diagnosis report comprising:
 - ✓ Existing energy performance of their facility,
 - ✓ List of energy efficiency improvement measures,
 - ✓ Potential energy cost savings & payback
- Improved energy efficiency → enhanced business competitiveness
- SMEs will be exposed to energy management practices → further enhance staff competencies



Energy Efficient Technology Centre (EETC)

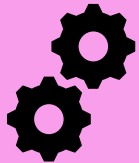


Form of Assistance

EETC aims to provide low-cost high quality energy assessments

Energy Assessment Fee

- ✓ Full Fee: \$15,000
- ✓ Subsidized Fee: \$3,000
- ✓ **Promotional Fee: \$1,000**



Systems

Examples (non-exhaustive):

- ✓ lighting
- ✓ heating system
- ✓ cooling system
- ✓ air compressor system
- ✓ motor driven system
- ✓ chilled water system

THANK YOU

NEA E2F: NEA_E2F@nea.gov.sg
EETC: tingting.liau@singaporetech.edu.sg



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