

Forms of Energy Utilization Manual and Essential Particulars

I. Energy Users as Electricity Generation

i. Format

- (i) The text of Energy Utilization Manual shall be written horizontally. Text, figures, and tables, shall be in clear fonts with proper spacing. The compilation shall be concise and truthful. A4 (21 cm x 29.7 cm) paper is required, and the contents shall be printed on both sides of the paper except graphs or tables of special sizes.
- (ii) The sources of maps or photographs shall be properly cited. Colored maps and photographs shall be printed in colors. When the figures and tables exceed the size of paper, leaflets shall be used; the reduced or photocopied figures and tables shall be clear and easy to read.
- (iii) The applicant shall submit one version of printed Energy Utilization Manual in 15 copies, and one CD of an electronic copy saved in Microsoft Word format and related electronic records, or kindly submit the Manual online.

ii. Basic Information

Date: / /

(i) Basic Information of Applicant					
Plan Name					
Applicant ⁽¹⁾					
Responsible Person					
Address					
Contact					
Phone No.		Fax			
E-Mail					
Industrial Classification ⁽²⁾					
(ii) Basic Information of Project					
1. Plan Summary	Plan Location ⁽³⁾				
	Plan Site ⁽⁴⁾		<input type="checkbox"/> Northern <input type="checkbox"/> Central <input type="checkbox"/> Southern <input type="checkbox"/> Offshore islands		
	Construction Period ⁽⁵⁾		From		To
	Projected Commercialization Year/Month		Year		Month
	Purpose of Plan				
2. Energy Consumption Category and Volume	Category		<input type="checkbox"/> Coal (Ton/Year)	<input type="checkbox"/> Natural Gas (1,000 m ³ /Year)	<input type="checkbox"/> Plant Power Consumption (kW)
					<input type="checkbox"/> Private-Produced <input type="checkbox"/> External-Imported
	Volume ⁽⁶⁾		Existing		
		Proposed			
Category		<input type="checkbox"/> Petroleum Products ⁽⁷⁾ (kL/Year)			

		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Volume	Existing			
		Proposed			
3. Rated thermal input ⁽⁸⁾ (MW _{th})					
4. Installed capacity (MW _e)					
5. Electrical efficiency ⁽⁹⁾ (% LHV)			6. Fuel utilization ⁽¹⁰⁾ (% LHV)		

(For other matters requiring further explanation, please attach additional spaces to the chart)

Note:

- (1) If the applicant is the energy user of a massive investment and production plan, the applicant shall provide the name of the registered legal entity with the Ministry of Economic Affairs, as well as Tax ID Number; if the applicant is still in the preparatory stage, please indicate the name of preparatory office.
- (2) Please indicate the industry in accordance with ROC Statistical Classification of Industries.
- (3) Plan location refers to the address of the new establishment or expansion of energy consumption facilities; projects without addresses may fill in land number.
- (4) Plan site refers to the region of the project. Northern refers to the region north of Feng-Shan River and He-Ping River; Central refers to the region south of Feng-Shan River and north of Cho-Shui River, and Hualien County; Southern refers to the region south of Cho-Shui River and Taitung County that is not included in the Northern or Central regions; Offshore islands refers to islands that are not connected with the power grid of the island of Taiwan.
- (5) Please enter common date.
- (6) In new establishment plans, volume refers to the maximum annual consumption after commercialization; in expansion plans, volume refers to the maximum additional annual consumption after commercialization.
- (7) Please indicate the type of petroleum products, such as fuel oil, gasoline, diesel and so on.
- (8) Rated thermal input: The rate at which fuel can be burned at the maximum continuous rating of the equipment multiplied by the total calorific value of the fuel and expressed as megawatts thermal.
- (9) Electrical Efficiency Equation is as follows:

$$\eta_{net} = \frac{P_{el,net} * 860}{\dot{m}_{fuel} H_u} = \frac{(P_{el,gross} - P_{aux}) * 860}{\dot{m}_{fuel} H_u}$$

$P_{el, gross}$: Optimized maximum power output under design conditions (kW)

$P_{el, net}$: Net optimized maximum power output under design conditions (kW)

P_{aux} : Designed value for station service load (kW)

\dot{m}_{fuel} : Total fuel input per hour under design conditions (kg/h)

H_u : Fuel calorific value (kcal/kg), LHV

*1kW = 860kcal/h

(10) Fuel Utilization Equation is as follows:

$$\epsilon_{net} = \frac{P_{el, net} * 860 + \dot{Q}_{net}}{\dot{m}_{fuel} H_u}$$

$P_{el, net}$: Net optimized maximum power output under design conditions (kW)

\dot{Q}_{net} : Net optimized thermal output per hour under design conditions (kcal/h)

\dot{m}_{fuel} : Total fuel input per hour under design conditions (kg/h)

H_u : Fuel calorific value (kcal/kg), LHV

*1kW = 860kcal/h

7. Site⁽¹¹⁾

(11) Using a 1/5000 or 1/10000 scale basic figure or reduced size map of Taiwan to disclose the development site and transportation, rivers, urban plan, terrain, surface features, landform, schools, and communities in the surrounding areas within a 1- to 5-kilometer radius. Developments over 10 hectares (including) or linear developments stretching beyond 10 kilometers shall be indicated on a 1/25000 or 1/50000 scale map or topographic map.

8. Layout⁽¹²⁾

(12) The layout shall be clearly labeled, such as the relative positions of each venues (facilities), dimensions, and distances; the actual distances or scale shall also be indicated, as well as legends, orientation, and other necessary matters that benefit the assessment.

iii. Information Checklist

(i) Processing Techniques

Applicant Self-Checklist
<p><input type="checkbox"/> BATs shall be applied in Processing Techniques for Electricity Generation in Appendix 2 of Regulations Governing the Assessment of Energy Development and Utilization. In accordance with the version of EU Reference Document on Best Available Techniques for Large Combustion Plants: <u>BREF (2021)</u></p> <p><input type="checkbox"/> BATs shall not be applied in Processing Techniques for Electricity Generation in Appendix 2 of Regulations Governing the Assessment of Energy Development and Utilization. Described as follows: (Please specify the reason why the BATs are not applicable, and the standards to be adapted)</p>
<p>1. LHV (1) Energy Category: _____; Combustion technology: _____</p>
<p>(2) Net electrical efficiency (% LHV) of planning unit: _____ <input type="checkbox"/> In accordance with net electrical efficiency of EU BAT <input type="checkbox"/> Not in accordance with net electrical efficiency of EU BAT Described as follows: (Please elaborate how the efficiency value is estimated)</p>
<p>(3) Fuel utilization (% LHV) of planning unit: _____ <input type="checkbox"/> In accordance with fuel utilization of EU BAT <input type="checkbox"/> Not in accordance with fuel utilization of EU BAT Described as follows: (Please elaborate how the efficiency value is estimated)</p>
<p>2. (The BAT of Processing Techniques) (1) (The BAT of Processing Techniques) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p>
<p>(For other BAT of Processing Techniques, please attach additional spaces to the chart)</p>

(For other matters requiring further explanation, please attach additional spaces to the chart)

(ii) Utility Systems and Equipment ⁽¹³⁾

Applicant Self-Checklist
<p>BATs shall be applied in Utility Systems and Equipment in Appendix 1 of Regulations Governing the Assessment of Energy Development and Utilization.</p> <p><input type="checkbox"/> Yes.</p> <p><input type="checkbox"/> No. It isn't applicable in circumstances of being restricted by laws and regulations, patent right protection, international trade barriers, or other factors not attributable to the applicants, given evidence are submitted by the applicants.</p> <p>Described as follows: (Please specify the reason why the BATs are not applicable, and the standards to be adapted, for each system respectively)</p>
<p>1. The item is whether the combustion handling systems would be installed:</p> <p><input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 23 below.</p> <p><input type="checkbox"/> No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 23 below.)</p>
<p>(1) Lignite pre-drying</p> <p><input type="checkbox"/> Applicable</p> <p><input type="checkbox"/> Partially applicable</p> <p><input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>
<p>(2) Coal gasification</p> <p><input type="checkbox"/> Applicable</p> <p><input type="checkbox"/> Partially applicable</p> <p><input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>
<p>(3) Fuel drying</p> <p><input type="checkbox"/> Applicable</p> <p><input type="checkbox"/> Partially applicable</p> <p><input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>
<p>(4) Biomass gasification</p> <p><input type="checkbox"/> Applicable</p> <p><input type="checkbox"/> Partially applicable</p> <p><input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>

Applicant Self-Checklist

(5) Bark pressing

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(6) Expansion turbine to recover the energy content of pressurized gases

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(7) Advanced computerized control of combustion conditions for emission reduction and boiler performance

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(8) Using flue-gas heat to supply district heating system

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(9) Reducing excess air to achieve the optimum air-fuel ratio

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(10) Properly reducing the exhaust temperature to minimize heat loss

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(11) Reducing the concentration of carbon monoxide in the exhaust gas and improving boiler efficiency

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(12) Heat accumulation

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(13) Cooling tower discharge

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(14) Different techniques for the cooling system

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(15) Using waste heat to preheat gas fuels to improve thermal efficiency

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(16) Preheating combustion air to improve fuel efficiency

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(17) Installing recuperative or regenerative burners to recover burner waste heat

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(18) Controlling and optimizing combustion conditions by monitoring fuel, air flow rates, and oxygen content in flue gas

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(19) Fuel choice

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(20) Using oxyfuel combustion technology to improve energy efficiency

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(21) Reducing heat loss by insulation

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(22) Reducing heat loss caused by frequent opening and closing or poor sealing of furnace doors

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(23) Fluidised bed combustion

- Applicable
- Partially applicable
- Not applicable

Described as follows:

2. The item is whether the heat recovery systems would be installed:

- Yes. Provide further description in BAT Items 1 to 2 below.
- No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 2 below.)

Applicant Self-Checklist

(1) Monitoring the efficiency periodically

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(2) Preventing or removing the internal scaling and external dust accumulation of equipment

- Applicable
- Partially applicable
- Not applicable

Described as follows:

3. The item is whether the steam handling systems would be installed:

- Yes. Provide further description in BAT Items 1 to 28 below.
- No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 28 below.)

(1) Design - Energy efficient design and installation of steam distribution pipework

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(2) Design - Throttling devices and the use of backpressure turbines: utilize backpressure turbines instead of pressure-reducing valves (PRVs)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(3) Operation and Control - Improve operating procedures and boiler controls

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(4) Operation and Control - Use sequential boiler controls (apply only to sites with more than one boiler)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(5) Operation and Control - Install flue-gas isolation dampers (applicable only to sites with more than one boiler)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(6) Steam System - For feed water preheating, the following methods are available:

- <1>process waste heat recovery
- <2>recovery of heat energy from combustion air by economizer
- <3>heating condensate with deoxygenated feed water
- <4>using heat exchangers to condense the steam used for degassing and feed water heating

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(7) Steam System - Prevention and removal of scale deposits on heat transfer surfaces. (Clean boiler heat transfer surfaces)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(8) Steam System - Boiler blowdown is reduced by improving the water treatment system and installing automatic dissolved solids control equipment

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(9) Steam System - It is necessary to check and attach/repair the boiler refractory materials during regular inspection

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(10) Steam System - Optimizing the venting rate of deaerators

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(11) Steam System - Minimize boiler short cycling losses

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(12) Steam System - Carrying out boiler maintenance

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(13) Steam System - Optimizing the steam distribution system

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(14) Steam System - Isolate steam from unused lines

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(15) Steam System - Regularly inspecting and confirming the heat insulation of steam pipes and condensate return pipes. (Confirming the proper heat insulation of the pipes, pipe fittings, valve bodies, and tanks)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(16) Steam System - Implement a control and repair program for steam traps

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(17) Waste Heat Recovery System - Collect and return condensate to the boiler for re-use. (Optimize condensate recovery)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(18) Waste Heat Recovery System - Reuse of flash steam (Use high pressure condensate to make low pressure steam)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(19) Waste Heat Recovery System - Recover energy from boiler blowdown

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(20) Other - Expansion turbine to recover the energy content of pressurized gases

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(21) Other - Change turbine blades when repairing

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(22) Other - Using advanced materials to meet high steam parameter requirements to improve efficiency

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(23) Other - Supercritical steam parameters

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(24) Other -reheat

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(25) Other - Regenerative feed-water

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(26) Other - Utilization of the flue-gas for district heating

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(27) Other - Heat accumulation

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(28) Other - Advanced computerized control for gas turbines and heat recovery steam generators (HRSG)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

4. The item is whether the electric power supply systems would be installed ⁽¹⁴⁾:

- Yes. Provide further description in BAT Items 1 to 8 below.
- No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 8 below.)

(1) Installing capacitors in the AC circuits to reduce reactive power

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(2) Minimizing the operation of idling or lightly loaded motors

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(3) Avoiding the operation of equipment above its rated voltage

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(4) When a new or replacement motor is installed, a high efficiency motor (IE3 or higher) should be used

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(5) Ensure correct cable sizing to meet power requirements

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(6) Keep online transformer(s) operating at a load above 40 ~50 % of the rated power

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(7) Use high efficiency/low loss transformers

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(8) Place equipment with a high current demand as close as possible to the power source (e.g. transformer)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

5. The item is whether the electric motor drive subsystems would be installed:

- Yes. Provide further description in BAT Items 1 to 7 below.
- No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 7 below.)

(1) System installation or update - Using efficient motors (EEMs) (IE3 or higher)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(2) System installation or update - Proper motor sizing

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(3) System installation or update - Installing high efficiency transmission/reducers

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(4) System installation or update - Use: direct coupling where possible, synchronous belts or cogged V-belts in place of V belts, helical gears in place of worm gears

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(5) System installation or update - Rewinding: avoid rewinding and replace with an EEM, or use a certified rewinding contractor

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(6) System installation or update - Power quality control

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(7) System Operation and Maintenance - Lubrication, adjustments, tuning

- Applicable
- Partially applicable
- Not applicable

Described as follows:

6. The item is whether the air compressor systems would be installed:

- Yes. Provide further description in BAT Items 1 to 13 below.
- No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 13 below.)

(1) System design, installation or update - Integrated system design, including multi-pressure level systems

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(2) System design, installation or update - Improve cooling, drying and filtering

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(3) System design, installation or update - Reduce frictional pressure losses (for example by increasing pipe diameter)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(4) System design, installation or update - Improvement of drives (high efficiency motors)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(5) System design, installation or update - Improvement of drives (speed controller)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(6) System design, installation or update - Use of sophisticated control systems

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(7) System design, installation or update - Repurposing waste heat for alternative applications

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(8) System design, installation or update - Use cool outdoor air as intake

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(9) System design, installation or update - Storage of compressed air near highly-fluctuating uses

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(10) System Operation and Maintenance - Optimize certain end use devices

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(11) System Operation and Maintenance - Reduce compressed air leakage

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(12) System Operation and Maintenance - More frequent filter replacement

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(13) System Operation and Maintenance - Optimize working pressure

- Applicable
- Partially applicable
- Not applicable

Described as follows:

7. The item is whether the pump systems would be installed:

- Yes. Provide further description in BAT Items 1 to 11 below.
- No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 11 below.)

(1) Design and Update - Avoid oversizing pump specifications

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(2) Design - Match the correct choice of pump to the correct motor for the duty

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(3) Design - Design of pipework system

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(4) Design - Control and regulation system

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(5) Operation and Maintenance - Shut down unnecessary pumps

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(6) Operation and Maintenance - Use of variable speed drives (VSDs)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(7) Operation and Maintenance - Use of multiple pumps (number of units under control)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(8) Operation and Maintenance - Regular maintenance. Where unplanned maintenance becomes excessive, check for: cavitation, wear, wrong type of pump

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(9) Piping system - Minimize the number of valves and bends commensurate with keeping ease of operation and maintenance

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(10) Piping system - Avoid using too many bends (especially tight bends)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(11) Piping system - Ensure piping is not undersized

- Applicable
- Partially applicable
- Not applicable

Described as follows:

8. The item is whether the heating, ventilation, and air conditioning systems would be installed:

- Yes. Provide further description in BAT Items 1 to 11 below.
- No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 11 below.)

(1) Overall system design. Identify and equip areas separately for:

- <1>general ventilation
- <2>specific ventilation
- <3>process ventilation

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(2) Optimize the number, shape, and size of intakes

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(3) Use fans:

- <1>of high efficiency
- <2>designed to operate at optimal rate

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(4) Airflow management, including the consideration of balanced (supply and exhaust/ dual-flow) ventilation systems

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(5) Air system design:

- <1>ducts are of a sufficient size
- <2>circular ducts
- <3>avoid long runs and obstacles such as bends, narrow sections

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(6) Optimize electric motors, and consider installing a VSD

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(7) Use automatic control systems. Integrate with centralized technical management systems

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(8) Integration of air filters into air duct system and heat recovery from exhaust air (heat exchangers)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(9) Reduce heating/cooling needs by:

- <1>building insulation
- <2>energy-efficient glazing
- <3>air infiltration reduction
- <4>automatic closure of doors
- <5>destratification
- <6>lowering of temperature set point during non-production period (programmable regulation)
- <7>reduction of the set point for heating and raising it for cooling

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(10) Improve the efficiency of heating systems through:

- <1>recovery or use of wasted heat
- <2>heat pumps
- <3>radiative and local heating systems coupled with reduced temperature set points in the non-occupied areas of the buildings

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(11) Improve the efficiency of cooling systems through the use of free cooling

- Applicable
- Partially applicable
- Not applicable

Described as follows:

9. The item is whether the lighting systems would be installed:

- Yes. Provide further description in BAT Items 1 to 5 below.
- No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 5 below.)

Applicant Self-Checklist

(1) Lighting requirements analysis and design -Determining the lighting requirements based on the illuminance and spectral characteristics (color temperature and color rendition) required by the predetermined task

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(2) Lighting requirements analysis and design - Plan space and activities in order to optimize the use of natural light

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(3) Lighting requirements analysis and design - Selection of fixtures and lamps according to specific requirements for the intended use

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(4) Operation, control and maintenance - Use of lighting management control systems, including occupancy sensors, timers, etc.

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(5) Operation, control and maintenance - Train building occupants to use lighting equipment in the most efficient manner

- Applicable
- Partially applicable
- Not applicable

Described as follows:

10. The item is whether the drying, separation, and concentration processing systems would be installed:

- Yes. Provide further description in BAT Items 1 to 10 below.
- No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 10 below.)

Applicant Self-Checklist

(1) Design - Selecting the best separation technology or a combination of the following separation technologies to satisfy specific process equipment

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(2) Operation - Use of surplus heat from other processes

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(3) Operation - Use a combination of techniques

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(4) Operation - Mechanical processes, e.g. filtration, membrane filtration

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(5) Operation - Heat drying method:

- <1> directly heated dryers
- <2> indirectly heated dryers
- <3> using multiple effect

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(6) Operation - Superheated steam

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(7) Operation - Heat recovery (including MVR and heat pumps)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(8) Operation - Optimize insulation of the drying system

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(9) Operation - Radiation processes

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(10) Control - Process automation in thermal drying processes

- Applicable
- Partially applicable
- Not applicable

Described as follows:

11. The item is whether the industrial cooling systems would be installed:

- Yes. Provide further description in BAT Items 1 to 4 below.
- No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 4 below.)

(1) The overall system is designed based on the requirements of the manufacturing process and factory, and is categorized as:

- <1> closed type
- <2> open type
- Applicable
- Partially applicable
- Not applicable

Described as follows:

(2) For the BAT of the design phase of the industrial cooling systems, the lowest energy consumption is achieved by the following combinations:

- <1> reducing pressure loss in water flow and airflow
- <2> adopting high efficiency and low energy consumption equipment
- <3> reducing the number of energy-demanding equipment

Applicant Self-Checklist
<p><4> applying optimized cooling water treatment in water-cooled cooling systems to keep the heat transfer surfaces clean and avoid scaling, rusting, fouling, etc., so that in each individual case, the lowest energy consuming combination of the above factors must be achieved to operate the industrial cooling systems</p> <p><input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>
<p>(3) The methods to reduce direct energy consumption are provided as follows.</p> <p>Fans or pumps:</p> <p><1> matching motors with high efficiency <2> designing for optimum pressure loss and flow rate <3> using speed variators</p> <p><input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>
<p>(4) Operating the industrial cooling systems according to process requirements:</p> <p><1> water supply pressure <2> backwater pressure <3> temperature of water supply <4> temperature difference between the water supply and backwater <5> pump efficiency <6> fan motor efficiency <7> point-of-use pressure requirements</p> <p><input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>

(For other matters requiring further explanation, please attach additional spaces to the chart)

(13) Public facilities include: combustion handling systems; heat recovery systems; steam handling systems; electric power supply systems; electric motor drive subsystems; air compressor systems; pump systems; heating, ventilation and air conditioning systems; lighting systems; drying, separation, and concentration processing systems; industrial cooling systems. If the facility has the said public facilities, please select “Yes” and

answer the following BAT items; if the facility does not have the said public facilities, answer “No” and explain why the facilities are not installed; no need to answer the BAT Items.

(14) This is the electric power supply system for station service load.

iv. Energy Management Measures

Item	Description
<input type="checkbox"/> Energy Management System	(Ex: Plan to install energy management computer control system, plan to deploy energy management staff...)
<input type="checkbox"/> Green Energy Introduction	(Ex: Plan to install solar PV panels, plan to install wind turbines, plan to install solar water heater...etc.)
<input type="checkbox"/> Plant Facility Optimization	(Ex: Plan to obtain Green Factory or Green Building Certifications)
<input type="checkbox"/> Others	

(For other matters requiring further explanation, please attach additional spaces to the chart)

v. Appendix: Required Related Information and Documents

- (i) Fuel Sources: The source of supply of the required energy category of the generating equipment.
- (ii) Other Related Information and Documents: Those adopting new processing techniques must provide qualitative or quantitative descriptions of efficiency greater than existing standards.

II. Energy Users as Cogeneration Systems

i. Format

- (i) The text of Energy Utilization Manual shall be written horizontally. Text, figures, and tables, shall be in clear fonts with proper spacing. The compilation shall be concise and truthful. A4 (21 cm x 29.7 cm) paper is required, and the contents shall be printed on both sides of the paper except graphs or tables of special sizes.
- (ii) The sources of maps or photographs shall be properly cited. Colored maps and photographs shall be printed in colors. When the figures and tables exceed the size of paper, leaflets shall be used; the reduced or photocopied figures and tables shall be clear and easy to read.
- (iii) The applicant shall submit one version of printed Energy Utilization Manual in 15 copies, and one CD of an electronic copy saved in Microsoft Word format and related electronic records, or kindly submit the Manual online.

ii. Basic Information

Date: / /

(i) Basic Information of Applicant						
Plan Name						
Applicant ⁽¹⁾						
Responsible Person						
Address						
Contact						
Phone No.		Fax				
E-Mail						
Industrial Classification ⁽²⁾						
(ii) Basic Information of Project						
1. Plan Summary	Plan Location ⁽³⁾					
	Plan Site ⁽⁴⁾		<input type="checkbox"/> Northern <input type="checkbox"/> Central <input type="checkbox"/> Southern <input type="checkbox"/> Offshore islands			
	Construction Period ⁽⁵⁾		From		To	
	Projected Commercialization Year/Month		Year		Month	
	Purpose of Plan					
			<input type="checkbox"/> Yes <input type="checkbox"/> No the Self-Use Power Generation Equipment is installed jointly by several applicants ⁽⁶⁾			
2. Energy Consumption Category and Volume	Category		<input type="checkbox"/> Coal (Ton/Year)	<input type="checkbox"/> Natural Gas (1,000 m ³ /Year)	<input type="checkbox"/> Plant Power Consumption (kW)	
					<input type="checkbox"/> Private-Produced	<input type="checkbox"/> External-Imported
	Volume ⁽⁷⁾				Existing	
					Proposed	
Category		<input type="checkbox"/> Petroleum Products ⁽⁸⁾ (kL/Year)				

			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Volume	Existing				
		Proposed				
3. Rated thermal input ⁽⁹⁾ (MW _{th})						
4. Installed capacity (MW _e)						
5. Effective thermal ratio (%) ⁽¹⁰⁾						
6. Electrical efficiency ⁽¹¹⁾ (% LHV)			7. Fuel utilization ⁽¹²⁾ (% LHV)			

(For other matters requiring further explanation, please attach additional spaces to the chart)

Note:

- (1) If the applicant is the energy user of a massive investment and production plan, the applicant shall provide the name of the registered legal entity with the Ministry of Economic Affairs, as well as Tax ID Number; if the applicant is still in the preparatory stage, please indicate the name of preparatory office.
- (2) Please indicate the industry in accordance with ROC Statistical Classification of Industries.
- (3) Plan location refers to the address of the new establishment or expansion of energy consumption facilities; projects without addresses may fill in land number.
- (4) Plan site refers to the region of the project. Northern refers to the region north of Feng-Shan River and He-Ping River; Central refers to the region south of Feng-Shan River and north of Cho-Shui River, and Hualien County; Southern refers to the region south of Cho-Shui River and Taitung County that is not included in the Northern or Central regions; Offshore islands refers to islands that are not connected with the power grid of the island of Taiwan.
- (5) Please enter common date.
- (6) If the Self-Use Power Generation Equipment is installed jointly by several applicants, a joint declaration is required.
- (7) In new establishment plans, volume refers to the maximum annual consumption after commercialization; in expansion plans, volume refers to the maximum additional annual consumption after commercialization.
- (8) Please indicate the type of petroleum products, such as fuel oil, gasoline, diesel and so on.

(9) Rated thermal input: The rate at which fuel can be burned at the maximum continuous rating of the equipment multiplied by the total calorific value of the fuel and expressed as megawatts thermal.

(10) The effective thermal ratio of Cogeneration System is defined in the Article 3 of the Regulation for the Implementation of Cogeneration System.

(11) Electrical Efficiency Equation is as follows:

$$\eta_{net} = \frac{P_{el,net} * 860}{\dot{m}_{fuel} H_u} = \frac{(P_{el,gross} - P_{aux}) * 860}{\dot{m}_{fuel} H_u}$$

$P_{el,gross}$: Optimized maximum power output under design conditions (kW)

$P_{el,net}$: Net optimized maximum power output under design conditions (kW)

P_{aux} : Designed value for station service load (kW)

\dot{m}_{fuel} : Total fuel input per hour under design conditions (kg/h)

H_u : Fuel calorific value (kcal/kg), LHV

*1kW = 860kcal/h

(12) Fuel Utilization Equation is as follows:

$$\varepsilon_{net} = \frac{P_{el,net} * 860 + \dot{Q}_{net}}{\dot{m}_{fuel} H_u}$$

$P_{el,net}$: Net optimized maximum power output under design conditions (kW)

\dot{Q}_{net} : Net optimized thermal output per hour under design conditions (kcal/h)

\dot{m}_{fuel} : Total fuel input per hour under design conditions (kg/h)

H_u : Fuel calorific value (kcal/kg), LHV

*1kW = 860kcal/h

8. Site⁽¹³⁾

(13) Using a 1/5000 or 1/10000 scale basic figure or reduced size map of Taiwan to disclose the development site and transportation, rivers, urban plan, terrain, surface features, landform, schools, and communities in the surrounding areas within a 1- to 5-kilometer radius. Developments over 10 hectares (including) or linear developments stretching beyond 10 kilometers shall be indicated on a 1/25000 or 1/50000 scale map or topographic map.

9. Layout⁽¹⁴⁾

(14) The layout shall be clearly labeled, such as the relative positions of each venues (facilities), dimensions, and distances; the actual distances or scale shall also be indicated, as well as legends, orientation, and other necessary matters that benefit the assessment.

iii. Information Checklist

(i) Processing Techniques

Applicant Self-Checklist
<p><input type="checkbox"/> BATs shall be applied in Processing Techniques for Cogeneration Systems in Appendix 2 of Regulations Governing the Assessment of Energy Development and Utilization.</p> <p><input type="checkbox"/> In accordance with the version of EU BREFs Industry: Industry: _____ Version: _____</p> <p><input type="checkbox"/> In accordance with the version of EU Reference Document on Best Available Techniques for Large Combustion Plants: <u>BREF 2021</u> (If the said BREFs are applicable, please fill in the following content in accordance with the BATs in Processing Techniques for Electricity Generation)</p> <p><input type="checkbox"/> BATs shall not be applied in Processing Techniques for caused by Systems in Appendix 2 of Regulations Governing the Assessment of Energy Development and Utilization. Described as follows: (Please elaborate how the efficiency value is estimated)</p>
1. LHV (1) Energy Category: _____; Combustion technology: _____
(2) Net electrical efficiency (% LHV) of planning unit: _____ <input type="checkbox"/> In accordance with net electrical efficiency of EU BAT <input type="checkbox"/> Not in accordance with net electrical efficiency of EU BAT Described as follows:
(3) Fuel utilization (% LHV) of planning unit: _____ <input type="checkbox"/> In accordance with fuel utilization of EU BAT <input type="checkbox"/> Not in accordance with fuel utilization of EU BAT Described as follows:
2. (The BAT of Processing Techniques) (1) (The BAT of Processing Techniques) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
(For other BAT of Processing Techniques, please attach additional spaces to the chart)

(ii) Utility Systems and Equipment ⁽¹⁵⁾

Applicant Self-Checklist
<p>BATs shall be applied in Utility Systems and Equipment in Appendix 1 of Regulations Governing the Assessment of Energy Development and Utilization.</p> <p><input type="checkbox"/> Yes.</p> <p><input type="checkbox"/> No. It isn't applicable in circumstances of being restricted by laws and regulations, patent right protection, international trade barriers, or other factors not attributable to the applicants, given evidence are submitted by the applicants.</p> <p>Described as follows: (Please specify the reason why the BATs are not applicable, and the standards to be adapted, for each system respectively)</p>
<p>1. The item is whether the combustion handling systems would be installed:</p> <p><input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 23 below.</p> <p><input type="checkbox"/> No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 23 below.)</p>
<p>(1) Lignite pre-drying</p> <p><input type="checkbox"/> Applicable</p> <p><input type="checkbox"/> Partially applicable</p> <p><input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>
<p>(2) Coal gasification</p> <p><input type="checkbox"/> Applicable</p> <p><input type="checkbox"/> Partially applicable</p> <p><input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>
<p>(3) Fuel drying</p> <p><input type="checkbox"/> Applicable</p> <p><input type="checkbox"/> Partially applicable</p> <p><input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>
<p>(4) Biomass gasification</p> <p><input type="checkbox"/> Applicable</p> <p><input type="checkbox"/> Partially applicable</p> <p><input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>

Applicant Self-Checklist

(5) Bark pressing

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(6) Expansion turbine to recover the energy content of pressurized gases

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(7) Advanced computerized control of combustion conditions for emission reduction and boiler performance

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(8) Using flue-gas heat to supply district heating system

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(9) Reducing excess air to achieve the optimum air-fuel ratio

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(10) Properly reducing the exhaust temperature to minimize heat loss

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(11) Reducing the concentration of carbon monoxide in the exhaust gas and improving boiler efficiency

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(12) Heat accumulation

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(13) Cooling tower discharge

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(14) Different techniques for the cooling system

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(15) Using waste heat to preheat gas fuels to improve thermal efficiency

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(16) Preheating combustion air to improve fuel efficiency

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(17) Installing recuperative or regenerative burners to recover burner waste heat

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(18) Controlling and optimizing combustion conditions by monitoring fuel, air flow rates, and oxygen content in flue gas

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(19) Fuel choice

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(20) Using oxyfuel combustion technology to improve energy efficiency

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(21) Reducing heat loss by insulation

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(22) Reducing heat loss caused by frequent opening and closing or poor sealing of furnace doors

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(23) Fluidised bed combustion

- Applicable
- Partially applicable
- Not applicable

Described as follows:

2. The item is whether the heat recovery systems would be installed:

- Yes. Provide further description in BAT Items 1 to 2 below.
- No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 2 below.)

Applicant Self-Checklist

(1) Monitoring the efficiency periodically

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(2) Preventing or removing the internal scaling and external dust accumulation of equipment

- Applicable
- Partially applicable
- Not applicable

Described as follows:

3. The item is whether the steam handling systems would be installed:

- Yes. Provide further description in BAT Items 1 to 28 below.
- No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 28 below.)

(1) Design- Energy efficient design and installation of steam distribution pipework

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(2) Design- Throttling devices and the use of backpressure turbines: utilize backpressure turbines instead of pressure-reducing valves (PRVs)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(3) Operation and Control - Improve operating procedures and boiler controls

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(4) Operation and Control - Use sequential boiler controls (apply only to sites with more than one boiler)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(5) Operation and Control - Install flue-gas isolation dampers (applicable only to sites with more than one boiler)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(6) Steam System - For feed water preheating, the following methods are available:

- <1>process waste heat recovery
- <2>recovery of heat energy from combustion air by economizer
- <3>heating condensate with deoxygenated feed water
- <4>using heat exchangers to condense the steam used for degassing and feed water heating

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(7) Steam System - Prevention and removal of scale deposits on heat transfer surfaces. (Clean boiler heat transfer surfaces)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(8) Steam System - Boiler blowdown is reduced by improving the water treatment system and installing automatic dissolved solids control equipment

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(9) Steam System - It is necessary to check and attach/repair the boiler refractory materials during regular inspection

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(10) Steam System - Optimizing the venting rate of deaerators

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(11) Steam System - Minimize boiler short cycling losses

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(12) Steam System - Carrying out boiler maintenance

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(13) Steam System - Optimizing steam from distribution system

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(14) Steam System - Isolate steam from unused lines

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(15) Steam System - Regularly inspecting and confirming the heat insulation of steam pipes and condensate return pipes. (Confirming the proper heat insulation of the pipes, pipe fittings, valve bodies, and tanks)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(16) Steam System - Implement a control and repair program for steam traps

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(17) Waste Heat Recovery System - Collect and return condensate to the boiler for re-use. (Optimize condensate recovery)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(18) Waste Heat Recovery System - Reuse of flash steam (Use high pressure condensate to make low pressure steam)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(19) Waste Heat Recovery System - Recover energy from boiler blowdown

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(20) Other - Expansion turbine to recover the energy content of pressurized gases

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(21) Other - Change turbine blades when repairing

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(22) Other - Using advanced materials to meet high steam parameter requirements to improve efficiency

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(23) Other - Supercritical steam parameters

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(24) Other - reheat

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(25) Other - Regenerative feed-water

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(26) Other - Utilization Use of heat content of the flue-gas for district heating

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(27) Other - Heat accumulation

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(28) Other - Advanced computerized control for gas turbines and heat recovery steam generators (HRSG)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

4. The item is whether the electric power supply systems would be installed ⁽¹⁴⁾:

- Yes. Provide further description in BAT Items 1 to 8 below.
- No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 8 below.)

(1) Installing capacitors in the AC circuits to reduce reactive power

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(2) Minimizing the operation of idling or lightly loaded motors

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(3) Avoiding the operation of equipment above its rated voltage

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(4) When a new or replacement motor is installed, a high efficiency motor (IE3 or higher) should be used

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(5) Ensure correct cable sizing to meet power requirements

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(6) Keep online transformer(s) operating at a load above 40 ~50 % of the rated power

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(7) Use high efficiency/low loss transformers

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(8) Place equipment with a high current demand as close as possible to the power source (e.g. transformer)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

5. The item is whether the electric motor drive subsystems would be installed:

- Yes. Provide further description in BAT Items 1 to 7 below.
- No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 7 below.)

(1) System installation or update - Using efficient motors (EEMs) (IE3 or higher)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(2) System installation or update - Proper motor sizing

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(3) System installation or update - Installing high efficiency transmission/reducers

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(4) System installation or update - Use: direct coupling where possible, synchronous belts or cogged V-belts in place of V belts, helical gears in place of worm gears

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(5) System installation or update - Rewinding: avoid rewinding and replace with an EEM, or use a certified rewinding contractor

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(6) System installation or update - Power quality control

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(7) System Operation and Maintenance - Lubrication, adjustments, tuning

- Applicable
- Partially applicable
- Not applicable

Described as follows:

6. The item is whether the air compressor systems would be installed:

- Yes. Provide further description in BAT Items 1 to 13 below.
- No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 13 below.)

(1) System design, installation or update - Integrated system design, including multi-pressure level systems

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(2) System design, installation or update - Improve cooling, drying and filtering

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(3) System design, installation or update - Reduce frictional pressure losses (for example by increasing pipe diameter)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(4) System design, installation or update - Improvement of drives (high efficiency motors)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(5) System design, installation or update - Improvement of drives (speed controller)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(6) System design, installation or update - Use of sophisticated control systems

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(7) System design, installation or update - Repurposing waste heat for alternative applications

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(8) System design, installation or update - Use cool outdoor air as intake

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(9) System design, installation or update - Storage of compressed air near highly-fluctuating uses

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(10) System Operation and Maintenance - Optimize certain end use devices

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(11) System Operation and Maintenance - Reduce compressed air leakage

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(12) System Operation and Maintenance - More frequent filter replacement

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(13) System Operation and Maintenance - Optimize working pressure

- Applicable
- Partially applicable
- Not applicable

Described as follows:

7. The item is whether the pump systems would be installed:

- Yes. Provide further description in BAT Items 1 to 11 below.
- No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 11 below.)

(1) Design and Update - Avoid oversizing pump specifications

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(2) Design - Match the correct choice of pump to the correct motor for the duty

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(3) Design - Design of pipework system

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(4) Design - Control and regulation system

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(5) Operation and Maintenance - Shut down unnecessary pumps

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(6) Operation and Maintenance - Use of variable speed drives (VSDs)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(7) Operation and Maintenance - Use of multiple pumps (number of units under control)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(8) Operation and Maintenance - Regular maintenance. Where unplanned maintenance becomes excessive, check for: cavitation, wear, wrong type of pump

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(9) Piping system - Minimize the number of valves and bends commensurate with keeping ease of operation and maintenance

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(10) Piping system - Avoid using too many bends (especially tight bends)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(11) Piping system - Ensure piping is not undersized

- Applicable
- Partially applicable
- Not applicable

Described as follows:

8. The item is whether the heating, ventilation and air conditioning systems would be installed:

- Yes. Provide further description in BAT Items 1 to 11 below.
- No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 11 below.)

(1) Overall system design. Identify and equip areas separately for:

- <1>general ventilation
- <2>specific ventilation
- <3>process ventilation

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(2) Optimize the number, shape, and size of intakes

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(3) Use fans:

<1>of high efficiency

<2>designed to operate at optimal rate

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(4) Airflow management, including the consideration of balanced (supply and exhaust/ dual-flow) ventilation systems

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(5) Air system design:

<1>ducts are of a sufficient size

<2>circular ducts

<3>avoid long runs and obstacles such as bends, narrow sections

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(6) Optimize electric motors, and consider installing a VSD

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(7) Use automatic control systems. Integrate with centralized technical management systems

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(8) Integration of air filters into air duct system and heat recovery from exhaust air (heat exchangers)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(9) Reduce heating/cooling needs by:

- <1>building insulation
- <2>energy-efficient glazing
- <3>air infiltration reduction
- <4>automatic closure of doors
- <5>destratification
- <6>lowering of temperature set point during non-production period (programmable regulation)
- <7>reduction of the set point for heating and raising it for cooling

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(10) Improve the efficiency of heating systems through:

- <1>recovery or use of wasted heat
- <2>heat pumps
- <3>radiative and local heating systems coupled with reduced temperature set points in the non-occupied areas of the buildings

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(11) Improve the efficiency of cooling systems through the use of free cooling

- Applicable
- Partially applicable
- Not applicable

Described as follows:

9. The item is whether the lighting systems would be installed:

- Yes. Provide further description in BAT Items 1 to 5 below.
- No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 5 below.)

Applicant Self-Checklist

(1) Lighting requirements analysis and design - Determining the lighting requirements based on the illuminance and spectral characteristics (color temperature and color rendition) required by the predetermined task

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(2) Lighting requirements analysis and design - Plan space and activities in order to optimize the use of natural light

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(3) Lighting requirements analysis and design - Selection of fixtures and lamps according to specific requirements for the intended use

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(4) Operation, control and maintenance - Use of lighting management control systems, including occupancy sensors, timers, etc.

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(5) Operation, control and maintenance - Train building occupants to use lighting equipment in the most efficient manner

- Applicable
- Partially applicable
- Not applicable

Described as follows:

10. The item is whether the drying, separation, and concentration processing systems would be installed:

- Yes. Provide further description in BAT Items 1 to 10 below.
- No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 10 below.)

Applicant Self-Checklist

(1) Design - Selecting the best separation technology or a combination of the following separation technologies to satisfy specific process equipment

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(2) Operation - Use of surplus heat from other processes

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(3) Operation - Use a combination of techniques

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(4) Operation - Mechanical processes, e.g. filtration, membrane filtration

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(5) Operation - Heat drying method:

- <1> directly heated dryers
- <2> indirectly heated dryers
- <3> using multiple effect

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(6) Operation - Superheated steam

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(7) Operation - Heat recovery (including MVR and heat pumps)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(8) Operation - Optimize insulation of the drying system

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(9) Operation - Radiation processes

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(10) Control - Process automation in thermal drying processes

- Applicable
- Partially applicable
- Not applicable

Described as follows:

11. The item is whether the industrial cooling systems would be installed:

- Yes. Provide further description in BAT Items 1 to 4 below.
- No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 4 below.)

(1) The overall system is designed based on the requirements of the manufacturing process and factory and is categorized as:

- <1> closed type
- <2> open type
- Applicable
- Partially applicable
- Not applicable

Described as follows:

(2) For the BAT of the design phase of the industrial cooling systems, the lowest energy consumption is achieved by the following combinations:

- <1> reducing pressure loss in water flow and airflow
- <2> adopting high efficiency and low energy consumption equipment
- <3> reducing the number of energy-demanding equipment

Applicant Self-Checklist
<p><4> applying optimized cooling water treatment in water-cooled cooling systems to keep the heat transfer surfaces clean and avoid scaling, rusting, fouling, etc., so that in each individual case, the lowest energy consuming combination of the above factors must be achieved to operate the industrial cooling systems</p> <p><input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>
<p>(3) The methods to reduce direct energy consumption are provided as follows.</p> <p>Fans or pumps:</p> <p><1> matching motors with high efficiency <2> designing for optimum pressure loss and flow rate <3> using speed variators</p> <p><input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>
<p>(4) Operating the industrial cooling systems according to process requirements:</p> <p><1> water supply pressure <2> backwater pressure <3> temperature of water supply <4> temperature difference between the water supply and backwater <5> pump efficiency <6> fan motor efficiency <7> point-of-use pressure requirements</p> <p><input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>

(For other matters requiring further explanation, please attach additional spaces to the chart)

(15) Public facilities include: combustion handling systems; heat recovery systems; steam handling systems; electric power supply systems; electric motor drive subsystems; air compressor systems; pump systems; heating, ventilation and air conditioning systems; lighting systems; drying, separation, and concentration processing systems; industrial cooling systems. If the facility has the said public facilities, please select “Yes” and answer the following BAT items; if the facility does not have the said public facilities,

answer “No” and explain why the facilities are not installed; no need to answer the BAT Items.

(16) This is the electric power supply system for station service load.

iv. Energy Management Measures

Item	Description
<input type="checkbox"/> Energy Management System	(Ex: Plan to install energy management computer control system, plan to deploy energy management staff...)
<input type="checkbox"/> Green Energy Introduction	(Ex: Plan to install solar PV panels, plan to install wind turbines, plan to install solar water heater...etc.)
<input type="checkbox"/> Plant Facility Optimization	(Ex: Plan to obtain Green Factory or Green Building Certifications)
<input type="checkbox"/> Others	

(For other matters requiring further explanation, please attach additional spaces to the chart)

v. Appendix: Required Related Information and Documents

- (i) Fuel Sources: The source of supply of the required energy category of the generating equipment.
- (ii) Other Related Information and Documents: Those adopting new processing techniques must provide qualitative or quantitative descriptions of efficiency greater than existing standards.

	Volume	Existing					
		Proposed					
B. Cogeneration System using Fossil Fuels			<input type="checkbox"/> Installed	<input type="checkbox"/> Coal-Fired Unit <input type="checkbox"/> Gas-Fired Unit <input type="checkbox"/> Oil-Fired Unit Rated thermal input ⁽⁹⁾ : _____ (MW _{th}) Installed capacity: _____ (MW _e) Effective thermal ratio ⁽¹⁰⁾ : _____ (%) Electrical efficiency ⁽¹¹⁾ : _____ (% LHV) Fuel utilization ⁽¹²⁾ : _____ (% LHV)			
				<input type="checkbox"/> Not Installed			

Note:

- (1) If the applicant is the energy user of a massive investment and production plan, the applicant shall provide the name of the registered legal entity with the Ministry of Economic Affairs, as well as Tax ID Number; if the applicant is still in the preparatory stage, please indicate the name of preparatory office.
- (2) Please indicate the industry in accordance with ROC Statistical Classification of Industries.
- (3) Plan location refers to the address of the new establishment or expansion of energy consumption facilities; projects without addresses may fill in land number.
- (4) Plan site refers to the region of the project. Northern refers to the region north of Feng-Shan River and He-Ping River; Central refers to the region south of Feng-Shan River and north of Cho-Shui River, and Hualien County; Southern refers to the region south of Cho-Shui River and Taitung County that is not included in the Northern or Central regions; Offshore islands refers to islands that are not connected with the power grid of the island of Taiwan.
- (5) Please enter common date.
- (6) Refer to Utilities Supply Contract Capacity or Self-usage Power Generation Capacity.
- (7) In new establishment plans, volume refers to the maximum annual consumption after commercial operation; in expansion plans, volume refers to the maximum additional annual consumption after the commercialization; for those with cogeneration system, volume should be the maximum sum of all energy used, combining both cogeneration system and other main energy-using facilities.
- (8) Please indicate the type of petroleum products, such as fuel oil, gasoline, diesel and so on.

- (9) Rated thermal input: The rate at which fuel can be burned at the maximum continuous rating of the equipment multiplied by the total calorific value of the fuel and expressed as megawatts thermal.
- (10) The effective thermal ratio of Cogeneration System is defined in the Article 3 of the Regulation for the Implementation of Cogeneration System.
- (11) Electrical Efficiency Equation is as follows:

$$\eta_{net} = \frac{P_{el,net} * 860}{\dot{m}_{fuel} H_u} = \frac{(P_{el,gross} - P_{aux}) * 860}{\dot{m}_{fuel} H_u}$$

$P_{el,gross}$: Optimized maximum power output under design conditions (kW)

$P_{el,net}$: Net optimized maximum power output under design conditions (kW)

P_{aux} : Designed value for station service load (kW)

\dot{m}_{fuel} : Total fuel input per hour under design conditions (kg/h)

H_u : Fuel calorific value (kcal/kg), LHV

*1kW = 860kcal/h

- (12) Fuel Utilization Equation is as follows:

$$\epsilon_{net} = \frac{P_{el,net} * 860 + \dot{Q}_{net}}{\dot{m}_{fuel} H_u}$$

$P_{el,net}$: Net optimized maximum power output under design conditions (kW)

\dot{Q}_{net} : Net optimized thermal output per hour under design conditions (kcal/h)

\dot{m}_{fuel} : Total fuel input per hour under design conditions (kg/h)

H_u : Fuel calorific value (kcal), LHV

*1kW = 860kcal/h

(3)Site⁽¹³⁾

(13) Using a 1/5000 or 1/10000 scale basic figure or reduced size map of Taiwan to disclose the development site and transportation, rivers, urban plan, terrain, surface features, landform, schools, and communities in the surrounding areas within a 1- to 5-kilometer radius. Developments over 10 hectares (including) or linear developments stretching beyond 10 kilometers shall be indicated on a 1/25000 or 1/50000 scale map or topographic map.

(4)Layout⁽¹⁴⁾

(14) The layout shall be clearly labeled, such as the relative positions of each venues (facilities), dimensions, and distances; the actual distances or scale shall also be indicated, as well as legends, orientation, and other necessary matters that benefit the assessment.

iii. Information Checklist

(i) Processing Techniques ⁽¹⁵⁾

Applicant Self-Checklist
<p><input type="checkbox"/> BATs shall be applied in Processing Techniques for Petroleum Refineries in Appendix 3 of Regulations Governing the Assessment of Energy Development and Utilization. In accordance with the version of EU Reference Document on Best Available: Techniques for the Refining of Mineral Oil and Gas: <u>BREF (2015)</u></p> <p><input type="checkbox"/> BATs shall not be applied in Processing Techniques for Petroleum Refineries in Appendix 3 of Regulations Governing the Assessment of Energy Development and Utilization. Described as follows:</p>
<p>1. (The BAT of Processing Techniques) (1) (The BAT of Processing Techniques)</p> <ul style="list-style-type: none"><input type="checkbox"/> Applicable<input type="checkbox"/> Partially applicable<input type="checkbox"/> Not applicable <p>Described as follows:</p>
<p>(For other BAT of Processing Techniques, please attach additional spaces to the chart)</p>

(For other matters requiring further explanation, please attach additional spaces to the chart)

(15) Processing techniques in compliance with EU BREFs shall be indicated. For processing techniques of EU BREFs industries that do not comply with regulations, explanations must be provided.

(ii) Utility Systems and Equipment ⁽¹⁶⁾

Applicant Self-Checklist
<p>BATs shall be applied in Utility Systems and Equipment in Appendix 1 of Regulations Governing the Assessment of Energy Development and Utilization.</p> <p><input type="checkbox"/> Yes.</p> <p><input type="checkbox"/> No. It isn't applicable in circumstances of being restricted by laws and regulations, patent right protection, international trade barriers, or other factors not attributable to the applicants, given evidence are submitted by the applicants.</p> <p>Described as follows:</p>
<p>1. The item is whether the combustion handling systems would be installed:</p> <p><input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 23 below.</p> <p><input type="checkbox"/> No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 23 below.)</p>
<p>(1) Lignite pre-drying</p> <p><input type="checkbox"/> Applicable</p> <p><input type="checkbox"/> Partially applicable</p> <p><input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>
<p>(2) Coal gasification</p> <p><input type="checkbox"/> Applicable</p> <p><input type="checkbox"/> Partially applicable</p> <p><input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>
<p>(3) Fuel drying</p> <p><input type="checkbox"/> Applicable</p> <p><input type="checkbox"/> Partially applicable</p> <p><input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>
<p>(4) Biomass gasification</p> <p><input type="checkbox"/> Applicable</p> <p><input type="checkbox"/> Partially applicable</p> <p><input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>
<p>(5) Bark pressing</p> <p><input type="checkbox"/> Applicable</p> <p><input type="checkbox"/> Partially applicable</p> <p><input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>

Applicant Self-Checklist

(6) Expansion turbine to recover the energy content of pressurized gases

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(7) Advanced computerized control of combustion conditions for emission reduction and boiler performance

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(8) Using flue-gas heat to supply district heating system

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(9) Reducing excess air to achieve the optimum air-fuel ratio

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(10) Properly reducing the exhaust temperature to minimize heat loss

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(11) Reducing the concentration of carbon monoxide in the exhaust gas and improving boiler efficiency

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(12) Heat accumulation

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(13) Cooling tower discharge

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(14) Different techniques for the cooling system

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(15) Using waste heat to preheat gas fuels to improve thermal efficiency

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(16) Preheating combustion air to improve fuel efficiency

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(17) Installing recuperative or regenerative burners to recover burner waste heat

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(18) Controlling and optimizing combustion conditions by monitoring fuel, air flow rates, and oxygen content in flue gas

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(19) Fuel choice

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(20) Using oxyfuel combustion technology to improve energy efficiency

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(21) Reducing heat loss by insulation

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(22) Reducing heat loss caused by frequent opening and closing or poor sealing of furnace doors

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(23) Fluidised bed combustion

- Applicable
- Partially applicable
- Not applicable

Described as follows:

2. The item is whether the heat recovery systems would be installed:

- Yes. Provide further description in BAT Items 1 to 2 below.
- No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 2 below.)

(1) Monitoring the efficiency periodically

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(2) Preventing or removing the internal scaling and external dust accumulation of equipment

- Applicable
- Partially applicable
- Not applicable

Described as follows:

3. The item is whether the steam handling systems would be installed:

- Yes. Provide further description in BAT Items 1 to 28 below.
- No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 28 below.)

(1) Design- Energy efficient design and installation of steam distribution pipework

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(2) Design- Throttling devices and the use of backpressure turbines: utilize backpressure turbines instead of pressure-reducing valves (PRVs)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(3) Operation and Control - Improve operating procedures and boiler controls

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(4) Operation and Control - Use sequential boiler controls (apply only to sites with more than one boiler)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(5) Operation and Control - Install flue-gas isolation dampers (applicable only to sites with more than one boiler)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(6) Steam System - For feed water preheating, the following methods are available:

- <1>process waste heat recovery
- <2>recovery of heat energy from combustion air by economizer
- <3>heating condensate with deoxygenated feed water
- <4>using heat exchangers to condense the steam used for degassing and feed water heating

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(7) Steam System - Prevention and removal of scale deposits on heat transfer surfaces. (Clean boiler heat transfer surfaces)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(8) Steam System - Boiler blowdown is reduced by improving the water treatment system and installing automatic dissolved solids control equipment

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(9) Steam System - It is necessary to check and attach/repair the boiler refractory materials during regular inspection

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(10) Steam System - Optimizing the venting rate of deaerators

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(11) Steam System - Minimize boiler short cycling losses

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(12) Steam System - Carrying out boiler maintenance

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(13) Steam System - Optimizing steam from distribution system

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(14) Steam System - Isolate steam from unused lines

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(15) Steam System - Regularly inspecting and confirming the heat insulation of steam pipes and condensate return pipes. (Confirming the proper heat insulation of the pipes, pipe fittings, valve bodies, and tanks)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(16) Steam System - Implement a control and repair program for steam traps

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(17) Waste Heat Recovery System - Collect and return condensate to the boiler for re-use. (Optimize condensate recovery)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(18) Waste Heat Recovery System - Reuse of flash steam Re-use of flash-steam.
(Use high pressure condensate to make low pressure steam)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(19) Waste Heat Recovery System - Recover energy from boiler blowdown

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(20) Other - Expansion turbine to recover the energy content of pressurized gases

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(21) Other - Change turbine blades when repairing

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(22) Other - Using advanced materials to meet high steam parameter requirements to improve efficiency

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(23) Other - Supercritical steam parameters

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(24) Other - reheat

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(25) Other - Regenerative feed-water

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(26) Other - Utilization of heat content of the flue-gas for district heating

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(27) Other - Heat accumulation

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(28) Other - Advanced computerized control for gas turbines and heat recovery steam generators (HRSG)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

4. The item is whether the electric power supply systems would be installed ⁽¹⁴⁾:

- Yes. Provide further description in BAT Items 1 to 8 below.
- No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 8 below.)

(1) Installing capacitors in the AC circuits to reduce reactive power

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(2) Minimizing the operation of idling or lightly loaded motors

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(3) Avoiding the operation of equipment above its rated voltage

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(4) When a new or replacement motor is installed, a high efficiency motor (IE3 or higher) should be used

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(5) Ensure correct cable sizing to meet power requirements

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(6) Keep online transformer(s) operating at a load above 40 ~50 % of the rated power

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(7) Use high efficiency/low loss transformers

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(8) Place equipment with a high current demand as close as possible to the power source (e.g. transformer)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

5. The item is whether the electric motor drive subsystems would be installed:

- Yes. Provide further description in BAT Items 1 to 7 below.
- No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 7 below.)

(1) System installation or update - Using energy efficient motors (EEMs) (IE3 or higher)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(2) System installation or update - Proper motor sizing

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(3) System installation or update - Installing high efficiency transmission/reducers

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(4) System installation or update - Use: direct coupling where possible, synchronous belts or cogged V-belts in place of V belts, helical gears in place of worm gears

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(5) System installation or update - Rewinding: avoid rewinding and replace with an EEM, or use a certified rewinding contractor

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(6) System installation or update - Power quality control

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(7) System Operation and Maintenance - Lubrication, adjustments, tuning

- Applicable
- Partially applicable
- Not applicable

Described as follows:

6. The item is whether the air compressor systems would be installed:

- Yes. Provide further description in BAT Items 1 to 13 below.
- No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 13 below.)

(1) System design, installation or update - Integrated system design, including multi-pressure level systems

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(2) System design, installation or update - Improve cooling, drying and filtering

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(3) System design, installation or update - Reduce frictional pressure losses (for example by increasing pipe diameter)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(4) System design, installation or update - Improvement of drives (high efficiency motors)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(5) System design, installation or update - Improvement of drives (speed controller)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(6) System design, installation or update - Use of sophisticated control systems

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(7) System design, installation or update - Repurposing waste heat for alternative applications

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(8) System design, installation or update - Use cool outdoor air as intake

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(9) System design, installation or update - Storage of compressed air near highly-fluctuating uses

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(10) System Operation and Maintenance - Optimize certain end use devices

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(11) System Operation and Maintenance - Reduce compressed air leakage

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(12) System Operation and Maintenance - More frequent filter replacement

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(13) System Operation and Maintenance - Optimize working pressure

- Applicable
- Partially applicable
- Not applicable

Described as follows:

7. The item is whether the pump systems would be installed:

- Yes. Provide further description in BAT Items 1 to 11 below.
- No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 11 below.)

(1) Design and Update - Avoid oversizing pump specifications

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(2) Design - Match the correct choice of pump to the correct motor for the duty

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(3) Design - Design of pipework system

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(4) Design - Control and regulation system

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(5) Operation and Maintenance - Shut down unnecessary pumps

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(6) Operation and Maintenance - Use of variable speed drives (VSDs)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(7) Operation and Maintenance - Use of multiple pumps (number of units under control)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(8) Operation and Maintenance - Regular maintenance. Where unplanned maintenance becomes excessive, check for: cavitation, wear, wrong type of pump

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(9) Piping system - Minimize the number of valves and bends commensurate with keeping ease of operation and maintenance

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(10) Piping system - Avoid using too many bends (especially tight bends)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(11) Piping system - Ensure piping is not undersized

- Applicable
- Partially applicable
- Not applicable

Described as follows:

8. The item is whether the heating, ventilation and air conditioning systems would be installed:

- Yes. Provide further description in BAT Items 1 to 11 below.
- No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 11 below.)

(1) Overall system design. Identify and equip areas separately for:

- <1>general ventilation
- <2>specific ventilation
- <3>process ventilation

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(2) Optimize the number, shape, and size of intakes

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(3) Use fans:

<1>of high efficiency

<2>designed to operate at optimal rate

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(4) Airflow management, including the consideration of balanced (supply and exhaust/ dual-flow) ventilation systems

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(5) Air system design:

<1>ducts are of a sufficient size

<2>circular ducts

<3>avoid long runs and obstacles such as bends, narrow sections

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(6) Optimize electric motors, and consider installing a VSD

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(7) Use automatic control systems. Integrate with centralized technical management systems

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(8) Integration of air filters into air duct system and heat recovery from exhaust air (heat exchangers)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(9) Reduce heating/cooling needs by:

- <1>building insulation
- <2>energy-efficient glazing
- <3>air infiltration reduction
- <4>automatic closure of doors
- <5>destratification
- <6>lowering of temperature set point during non-production period (programmable regulation)
- <7>reduction of the set point for heating and raising it for cooling

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(10) Improve the efficiency of heating systems through:

- <1>recovery or use of wasted heat
- <2>heat pumps
- <3>radiative and local heating systems coupled with reduced temperature set points in the non-occupied areas of the buildings

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(11) Improve the efficiency of cooling systems through the use of free cooling

- Applicable
- Partially applicable
- Not applicable

Described as follows:

9. The item is whether the lighting systems would be installed:

- Yes. Provide further description in BAT Items 1 to 5 below.
- No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 5 below.)

Applicant Self-Checklist

(1) Lighting requirements analysis and design - Determining the lighting requirements based on the illuminance and spectral characteristics (color temperature and color rendition) required by the predetermined task

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(2) Lighting requirements analysis and design - Plan space and activities in order to optimize the use of natural light

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(3) Lighting requirements analysis and design - Selection of fixtures and lamps according to specific requirements for the intended use

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(4) Operation, control and maintenance - Use of lighting management control systems, including occupancy sensors, timers, etc.

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(5) Operation, control and maintenance - Train building occupants to use lighting equipment in the most efficient manner

- Applicable
- Partially applicable
- Not applicable

Described as follows:

10. The item is whether the drying, separation, and concentration processing systems would be installed:

- Yes. Provide further description in BAT Items 1 to 10 below.
- No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 10 below.)

Applicant Self-Checklist

(1) Design - Selecting the best separation technology or a combination of the following separation technologies to satisfy specific process equipment

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(2) Operation - Use of surplus heat from other processes

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(3) Operation - Use a combination of techniques

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(4) Operation - Mechanical processes, e.g. filtration, membrane filtration

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(5) Operation - Heat drying method:

- <1> directly heated dryers
- <2> indirectly heated dryers
- <3> using multiple effect

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(6) Operation - Superheated steam

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(7) Operation - Heat recovery (including MVR and heat pumps)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(8) Operation - Optimize insulation of the drying system

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(9) Operation - Radiation processes

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(10) Control - Process automation in thermal drying processes

- Applicable
- Partially applicable
- Not applicable

Described as follows:

11. The item is whether the industrial cooling systems would be installed:

- Yes. Provide further description in BAT Items 1 to 4 below.
- No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 4 below.)

(1) The overall system is designed based on the requirements of the manufacturing process and factory and is categorized as:

- <1> closed type
- <2> open type
- Applicable
- Partially applicable
- Not applicable

Described as follows:

(2) For the BAT of the design phase of the industrial cooling systems, the lowest energy consumption is achieved by the following combinations:

- <1> reducing pressure loss in water flow and airflow
- <2> adopting high efficiency and low energy consumption equipment
- <3> reducing the number of energy-demanding equipment

Applicant Self-Checklist
<p><4> applying optimized cooling water treatment in water-cooled cooling systems to keep the heat transfer surfaces clean and avoid scaling, rusting, fouling, etc., so that in each individual case, the lowest energy consuming combination of the above factors must be achieved to operate the industrial cooling systems</p> <p><input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>
<p>(3) The methods to reduce direct energy consumption are provided as follows.</p> <p>Fans or pumps:</p> <p><1> matching motors with high efficiency <2> designing for optimum pressure loss and flow rate <3> using speed variators</p> <p><input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>
<p>(4) Operating the industrial cooling systems according to process requirements:</p> <p><1> water supply pressure <2> backwater pressure <3> temperature of water supply <4> temperature difference between the water supply and backwater <5> pump efficiency <6> fan motor efficiency <7> point-of-use pressure requirements</p> <p><input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>

(For other matters requiring further explanation, please attach additional spaces to the chart)

(16) Public facilities include: combustion handling systems; heat recovery systems; steam handling systems; electric power supply systems; electric motor drive subsystems; air compressor systems; pump systems; heating, ventilation and air conditioning systems; lighting systems; drying, separation, and concentration processing systems; industrial cooling systems. If the facility has the said public facilities, please select “Yes” and answer the following BAT items; if the facility does not have the said public facilities, answer “No” and explain why the facilities are not installed; no need to answer the BAT Items.

(3) Co-generation system less than 50MW

<p>The item is whether the co-generation systems less than 50MW would be installed:</p> <p><input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 5 below.</p> <p><input type="checkbox"/> No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 5 below.)</p>
<p>(1) System that generates effective thermal and electrical energy at the same time</p> <p><input type="checkbox"/> Applicable</p> <p><input type="checkbox"/> Partially applicable</p> <p><input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>
<p>(2) Steam turbines and the power generation system: considering the use of a computer-controlled system</p> <p><input type="checkbox"/> Applicable</p> <p><input type="checkbox"/> Partially applicable</p> <p><input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>
<p>(3) Steam turbines and the power generation system: considering the use of advanced materials</p> <p><input type="checkbox"/> Applicable</p> <p><input type="checkbox"/> Partially applicable</p> <p><input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>
<p>(4) Steam turbines and the power generation system: upgrading steam turbines requires a consideration of increasing steam temperature and pressure</p> <p><input type="checkbox"/> Applicable</p> <p><input type="checkbox"/> Partially applicable</p> <p><input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>
<p>(5) Steam turbines and the power generation system: optimizing working fluid operating conditions</p> <p><input type="checkbox"/> Applicable</p> <p><input type="checkbox"/> Partially applicable</p> <p><input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>

(For other matters requiring further explanation, please attach additional spaces to the chart)

iv. Energy Management Measures

Item	Description
<input type="checkbox"/> Energy Management System	(Ex: Plan to install energy management computer control system, plan to deploy energy management staff...)
<input type="checkbox"/> Green Energy Introduction	(Ex: Plan to install solar PV panels, plan to install wind turbines, plan to install solar water heater...etc.)
<input type="checkbox"/> Plant Facility Optimization	(Ex: Plan to obtain Green Factory or Green Building Certifications)
<input type="checkbox"/> Others	

(For other matters requiring further explanation, please attach additional spaces to the chart)

v. Appendix: Required Related Information and Documents

- (i) Letter of Approval for “Electricity Consumption Plan” / Explanation of self-usage power generation equipment: Please attach Letter of Approval for “Electricity Consumption Plan” / Explanation of self-usage power generation equipment.
- (ii) Other Related Information and Documents: Those adopting new processing techniques must provide qualitative or quantitative descriptions of efficiency greater than existing standards.

	B. Cogeneration System using Fossil Fuels	<input type="checkbox"/> Installed	<input type="checkbox"/> Coal-Fired Unit <input type="checkbox"/> Gas-Fired Unit <input type="checkbox"/> Oil-Fired Unit Rated thermal input ⁽⁹⁾ : _____ (MW _{th}) Installed capacity: _____ (MW _e) Effective thermal ratio ⁽¹⁰⁾ : _____ (%) Electrical efficiency ⁽¹¹⁾ : _____ (% LHV) Fuel utilization ⁽¹²⁾ : _____ (% LHV)
		<input type="checkbox"/> Not Installed	

Note:

- (1) If the applicant is the energy user of a massive investment and production plan, the applicant shall provide the name of the registered legal entity with the Ministry of Economic Affairs, as well as Tax ID Number; if the applicant is still in the preparatory stage, please indicate the name of preparatory office.
- (2) Please indicate the industry in accordance with ROC Statistical Classification of Industries.
- (3) Plan location refers to the address of the new establishment or expansion of energy consumption facilities; projects without addresses may fill in land number.
- (4) Plan site refers to the region of the project. Northern refers to the region north of Feng-Shan River and He-Ping River; Central refers to the region south of Feng-Shan River and north of Cho-Shui River, and Hualien County; Southern refers to the region south of Cho-Shui River and Taitung County that is not included in the Northern or Central regions; Offshore islands refers to islands that are not connected with the power grid of the island of Taiwan.
- (5) Please enter common date.
- (6) Refer to Utilities Supply Contract Capacity or Self-usage Power Generation Capacity.
- (7) In new establishment plans, volume refers to the maximum annual consumption after commercial operation; in expansion plans, volume refers to the maximum additional annual consumption after the commercialization; for those with cogeneration system, volume should be the maximum sum of all energy used, combining both cogeneration system and other main energy-using facilities.
- (8) Please indicate the type of petroleum products, such as fuel oil, gasoline, diesel and so on.

(9) Rated thermal input: The rate at which fuel can be burned at the maximum continuous rating of the equipment multiplied by the total calorific value of the fuel and expressed as megawatts thermal.

(10) The effective thermal ratio of Cogeneration System is defined in the Article 3 of the Regulation for the Implementation of Cogeneration System.

(11) Electrical Efficiency Equation is as follows:

$$\eta_{net} = \frac{P_{el,net} * 860}{\dot{m}_{fuel} H_u} = \frac{(P_{el,gross} - P_{aux}) * 860}{\dot{m}_{fuel} H_u}$$

$P_{el,gross}$: Optimized maximum power output under design conditions (kW)

$P_{el,net}$: Net optimized maximum power output under design conditions (kW)

P_{aux} : Designed value for station service load (kW)

\dot{m}_{fuel} : Total fuel input per hour under design conditions (kg/h)

H_u : Fuel calorific value (kcal/kg), LHV

*1kW = 860kcal/h

(12) Fuel Utilization Equation is as follows:

$$\epsilon_{net} = \frac{P_{el,net} * 860 + \dot{Q}_{net}}{\dot{m}_{fuel} H_u}$$

$P_{el,net}$: Net optimized maximum power output under design conditions (kW)

\dot{Q}_{net} : Net optimized thermal output per hour under design conditions (kcal/h)

\dot{m}_{fuel} : Total fuel input per hour under design conditions (kg/h)

H_u : Fuel calorific value (kcal/kg), LHV

*1kW = 860kcal/h

(3)Site⁽¹³⁾

(13) Using a 1/5000 or 1/10000 scale basic figure or reduced size map of Taiwan to disclose the development site and transportation, rivers, urban plan, terrain, surface features, landform, schools, and communities in the surrounding areas within a 1- to 5-kilometer radius. Developments over 10 hectares (including) or linear developments stretching beyond 10 kilometers shall be indicated on a 1/25000 or 1/50000 scale map or topographic map.

(4)Layout⁽¹⁴⁾

(14) The layout shall be clearly labeled, such as the relative positions of each venues (facilities), dimensions, and distances; the actual distances or scale shall also be indicated, as well as legends, orientation, and other necessary matters that benefit the assessment.

iii. Information Checklist

(i) Processing Techniques⁽¹⁵⁾

Applicant Self-Checklist
<p><input type="checkbox"/> BATs shall be applied in Processing Techniques in Appendix 3, 4, 5, 6, or 7 of Regulations Governing the Assessment of Energy Development and Utilization. Industry: _____ Version: _____</p> <p><input type="checkbox"/> BATs shall not be applied in Processing Techniques in Appendix 3, 4, 5, 6 or 7 of Regulations Governing the Assessment of Energy Development and Utilization.</p> <p><input type="checkbox"/> In accordance with the version of EU BREFs Industry: Industry: _____ Version: _____</p> <p><input type="checkbox"/> Not EU BREFs Industry Described as follows: (Please specify the reason why the BATs are not applicable, and the standards to be adapted)</p>
<p>1. (The BAT of Processing Techniques) (1) (The BAT of Processing Techniques) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p>
<p>(For other BAT of Processing Techniques, please attach additional spaces to the chart)</p>

(For other matters requiring further explanation, please attach additional spaces to the chart)

(15) Processing techniques in compliance with Appendix 3, 4, 5, 6 or 7 of Regulations Governing the Assessment of Energy Development and Utilization shall be indicated, explanations must be provided. If failing to comply with regulations, explanations must be provided. Processing techniques are incompatible with Appendix 3, 4, 5, 6 or 7 of Regulations Governing the Assessment of Energy Development and Utilization, qualitative or quantitative descriptions of efficiency should be provided by applicant.

(ii) Utility Systems and Equipment ⁽¹⁶⁾

Applicant Self-Checklist
<p>BATs shall be applied in Utility Systems and Equipment in Appendix 1 of Regulations Governing the Assessment of Energy Development and Utilization.</p> <p><input type="checkbox"/> Yes.</p> <p><input type="checkbox"/> No. It isn't applicable in circumstances of being restricted by laws and regulations, patent right protection, international trade barriers, or other factors not attributable to the applicants, given evidence are submitted by the applicants.</p> <p>Described as follows:</p>
<p>1. The item is whether the combustion handling systems would be installed:</p> <p><input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 23 below.</p> <p><input type="checkbox"/> No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 23 below.)</p>
<p>(1) Lignite pre-drying</p> <p><input type="checkbox"/> Applicable</p> <p><input type="checkbox"/> Partially applicable</p> <p><input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>
<p>(2) Coal gasification</p> <p><input type="checkbox"/> Applicable</p> <p><input type="checkbox"/> Partially applicable</p> <p><input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>
<p>(3) Fuel drying</p> <p><input type="checkbox"/> Applicable</p> <p><input type="checkbox"/> Partially applicable</p> <p><input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>
<p>(4) Biomass gasification</p> <p><input type="checkbox"/> Applicable</p> <p><input type="checkbox"/> Partially applicable</p> <p><input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>
<p>(5) Bark pressing</p> <p><input type="checkbox"/> Applicable</p> <p><input type="checkbox"/> Partially applicable</p> <p><input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>

Applicant Self-Checklist

(6) Expansion turbine to recover the energy content of pressurized gases

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(7) Advanced computerized control of combustion conditions for emission reduction and boiler performance

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(8) Using flue-gas heat to supply district heating system

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(9) Reducing excess air to achieve the optimum air-fuel ratio

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(10) Properly reducing the exhaust temperature to minimize heat loss

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(11) Reducing the concentration of carbon monoxide in the exhaust gas and improving boiler efficiency

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(12) Heat accumulation

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(13) Cooling tower discharge

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(14) Different techniques for the cooling system

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(15) Using waste heat to preheat gas fuels to improve thermal efficiency

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(16) Preheating combustion air to improve fuel efficiency

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(17) Installing recuperative or regenerative burners to recover burner waste heat

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(18) Controlling and optimizing combustion conditions by monitoring fuel, air flow rates, and oxygen content in flue gas

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(19) Fuel choice

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(20) Using oxyfuel combustion technology to improve energy efficiency

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(21) Reducing heat loss by insulation

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(22) Reducing heat loss caused by frequent opening and closing or poor sealing of furnace doors

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(23) Fluidised bed combustion

- Applicable
- Partially applicable
- Not applicable

Described as follows:

2. The item is whether the heat recovery systems would be installed:

- Yes. Provide further description in BAT Items 1 to 2 below.
- No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 2 below.)

(1) Monitoring the efficiency periodically

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(2) Preventing or removing the internal scaling and external dust accumulation of equipment

- Applicable
- Partially applicable
- Not applicable

Described as follows:

3. The item is whether the steam handling systems would be installed:

- Yes. Provide further description in BAT Items 1 to 28 below.
- No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 28 below.)

(1) Design- Energy efficient design and installation of steam distribution pipework

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(2) Design- Throttling devices and the use of backpressure turbines: utilize backpressure turbines instead of pressure-reducing valves (PRVs)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(3) Operation and Control - Improve operating procedures and boiler controls

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(4) Operation and Control - Use sequential boiler controls (apply only to sites with more than one boiler)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(5) Operation and Control - Install flue-gas isolation dampers (applicable only to sites with more than one boiler)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(6) Steam System - For feed water preheating, the following methods are available:

- <1>process waste heat recovery
- <2>recovery of heat energy from combustion air by economizer
- <3>heating condensate with deoxygenated feed water
- <4>using heat exchangers to condense the steam used for degassing and feed water heating

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(7) Steam System - Prevention and removal of scale deposits on heat transfer surfaces. (Clean boiler heat transfer surfaces)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(8) Steam System - Boiler blowdown is reduced by improving the water treatment system and installing automatic dissolved solids control equipment

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(9) Steam System - It is necessary to check and attach/repair the boiler refractory materials during regular inspection

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(10) Steam System - Optimizing the venting rate of deaerators

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(11) Steam System - Minimize boiler short cycling losses

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(12) Steam System - Carrying out boiler maintenance

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(13) Steam System - Optimizing steam from distribution system

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(14) Steam System - Isolate steam from unused lines

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(15) Steam System - Regularly inspecting and confirming the heat insulation of steam pipes and condensate return pipes. (Confirming the proper heat insulation of the pipes, pipe fittings, valve bodies, and tanks)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(16) Steam System - Implement a control and repair program for steam traps

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(17) Waste Heat Recovery System - Collect and return condensate to the boiler for re-use. (Optimize condensate recovery)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(18) Waste Heat Recovery System - Reuse of flash steam (Use high pressure condensate to make low pressure steam)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(19) Waste Heat Recovery System - Recover energy from boiler blowdown

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(20) Other - Expansion turbine to recover the energy content of pressurized gases

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(21) Other - Change turbine blades when repairing

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(22) Other - Using advanced materials to meet high steam parameter requirements to improve efficiency

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(23) Other - Supercritical steam parameters

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(24) Other - reheat

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(25) Other - Regenerative feed-water

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(26) Other - Utilization of heat content of the flue-gas for district heating

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(27) Other - Heat accumulation

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(28) Other - Advanced computerized control for gas turbines and heat recovery steam generators (HRSG)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

4. The item is whether the electric power supply systems would be installed ⁽¹⁴⁾:

- Yes. Provide further description in BAT Items 1 to 8 below.
- No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 8 below.)

(1) Installing capacitors in the AC circuits to reduce reactive power

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(2) Minimizing the operation of idling or lightly loaded motors

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(3) Avoiding the operation of equipment above its rated voltage

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(4) When a new or replacement motor is installed, a high efficiency motor (IE3 or higher) should be used

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(5) Ensure correct cable sizing to meet power requirements

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(6) Keep online transformer(s) operating at a load above 40 ~50 % of the rated power

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(7) Use high efficiency/low loss transformers

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(8) Place equipment with a high current demand as close as possible to the power source (e.g. transformer)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

5. The item is whether the electric motor drive subsystems would be installed:

- Yes. Provide further description in BAT Items 1 to 7 below.
- No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 7 below.)

(1) System installation or update - Using energy efficient motors (EEMs) (IE3 or higher)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(2) System installation or update - Proper motor sizing

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(3) System installation or update - Installing high efficiency transmission/reducers

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(4) System installation or update - Use: direct coupling where possible, synchronous belts or cogged V-belts in place of V belts, helical gears in place of worm gears

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(5) System installation or update - Rewinding: avoid rewinding and replace with an EEM, or use a certified rewinding contractor

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(6) System installation or update - Power quality control

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(7) System Operation and Maintenance - Lubrication, adjustments, tuning

- Applicable
- Partially applicable
- Not applicable

Described as follows:

6. The item is whether the air compressor systems would be installed:

- Yes. Provide further description in BAT Items 1 to 13 below.
- No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 13 below.)

(1) System design, installation or update - Integrated system design, including multi-pressure level systems

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(2) System design, installation or update - Improve cooling, drying and filtering

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(3) System design, installation or update - Reduce frictional pressure losses (for example by increasing pipe diameter)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(4) System design, installation or update - Improvement of drives (high efficiency motors)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(5) System design, installation or update - Improvement of drives (speed controller)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(6) System design, installation or update - Use of sophisticated control systems

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(7) System design, installation or update - Repurposing waste heat for alternative applications

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(8) System design, installation or update - Use cool outdoor air as intake

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(9) System design, installation or update - Storage of compressed air near highly-fluctuating uses

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(10) System Operation and Maintenance - Optimize certain end use devices

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(11) System Operation and Maintenance - Reduce compressed air leakage

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(12) System Operation and Maintenance - More frequent filter replacement

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(13) System Operation and Maintenance - Optimize working pressure

- Applicable
- Partially applicable
- Not applicable

Described as follows:

7. The item is whether the pump systems would be installed:

- Yes. Provide further description in BAT Items 1 to 11 below.
- No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 11 below.)

(1) Design and Update - Avoid oversizing pump specifications

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(2) Design - Match the correct choice of pump to the correct motor for the duty

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(3) Design - Design of pipework system

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(4) Design - Control and regulation system

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(5) Operation and Maintenance - Shut down unnecessary pumps

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(6) Operation and Maintenance - Use of variable speed drives (VSDs)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(7) Operation and Maintenance - Use of multiple pumps (number of units under control)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(8) Operation and Maintenance - Regular maintenance. Where unplanned maintenance becomes excessive, check for: cavitation, wear, wrong type of pump

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(9) Piping system - Minimize the number of valves and bends commensurate with keeping ease of operation and maintenance

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(10) Piping system - Avoid using too many bends (especially tight bends)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(11) Piping system - Ensure piping is not undersized

- Applicable
- Partially applicable
- Not applicable

Described as follows:

8. The item is whether the heating, ventilation and air conditioning systems would be installed:

- Yes. Provide further description in BAT Items 1 to 11 below.
- No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 11 below.)

(1) Overall system design. Identify and equip areas separately for:

- <1>general ventilation
- <2>specific ventilation
- <3>process ventilation

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(2) Optimize the number, shape, and size of intakes

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(3) Use fans:

<1>of high efficiency

<2>designed to operate at optimal rate

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(4) Airflow management, including the consideration of balanced (supply and exhaust/ dual-flow) ventilation systems

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(5) Air system design:

<1>ducts are of a sufficient size

<2>circular ducts

<3>avoid long runs and obstacles such as bends, narrow sections

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(6) Optimize electric motors, and consider installing a VSD

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(7) Use automatic control systems. Integrate with centralized technical management systems

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(8) Integration of air filters into air duct system and heat recovery from exhaust air (heat exchangers)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(9) Reduce heating/cooling needs by:

- <1>building insulation
- <2>energy-efficient glazing
- <3>air infiltration reduction
- <4>automatic closure of doors
- <5>destratification
- <6>lowering of temperature set point during non-production period (programmable regulation)
- <7>reduction of the set point for heating and raising it for cooling

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(10) Improve the efficiency of heating systems through:

- <1>recovery or use of wasted heat
- <2>heat pumps
- <3>radiative and local heating systems coupled with reduced temperature set points in the non-occupied areas of the buildings

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(11) Improve the efficiency of cooling systems through the use of free cooling

- Applicable
- Partially applicable
- Not applicable

Described as follows:

9. The item is whether the lighting systems would be installed:

- Yes. Provide further description in BAT Items 1 to 5 below.
- No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 5 below.)

Applicant Self-Checklist

(1) Lighting requirements analysis and design - Determining the lighting requirements based on the illuminance and spectral characteristics (color temperature and color rendition) required by the predetermined task

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(2) Lighting requirements analysis and design - Plan space and activities in order to optimize the use of natural light

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(3) Lighting requirements analysis and design - Selection of fixtures and lamps according to specific requirements for the intended use

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(4) Operation, control and maintenance - Use of lighting management control systems, including occupancy sensors, timers, etc.

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(5) Operation, control and maintenance - Train building occupants to use lighting equipment in the most efficient manner

- Applicable
- Partially applicable
- Not applicable

Described as follows:

10. The item is whether the drying, separation, and concentration processing systems would be installed:

- Yes. Provide further description in BAT Items 1 to 10 below.
- No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 10 below.)

Applicant Self-Checklist

(1) Design - Selecting the best separation technology or a combination of the following separation technologies to satisfy specific process equipment

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(2) Operation - Use of surplus heat from other processes

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(3) Operation - Use a combination of techniques

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(4) Operation - Mechanical processes, e.g. filtration, membrane filtration

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(5) Operation - Heat drying method:

- <1> directly heated dryers
- <2> indirectly heated dryers
- <3> using multiple effect

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(6) Operation - Superheated steam

- Applicable
- Partially applicable
- Not applicable

Described as follows:

Applicant Self-Checklist

(7) Operation - Heat recovery (including MVR and heat pumps)

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(8) Operation - Optimize insulation of the drying system

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(9) Operation - Radiation processes

- Applicable
- Partially applicable
- Not applicable

Described as follows:

(10) Control - Process automation in thermal drying processes

- Applicable
- Partially applicable
- Not applicable

Described as follows:

11. The item is whether the industrial cooling systems would be installed:

- Yes. Provide further description in BAT Items 1 to 4 below.
- No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 4 below.)

(1) The overall system is designed based on the requirements of the manufacturing process and factory and is categorized as:

- <1> closed type
- <2> open type
- Applicable
- Partially applicable
- Not applicable

Described as follows:

(2) For the BAT of the design phase of the industrial cooling systems, the lowest energy consumption is achieved by the following combinations:

- <1> reducing pressure loss in water flow and airflow
- <2> adopting high efficiency and low energy consumption equipment
- <3> reducing the number of energy-demanding equipment

Applicant Self-Checklist
<p><4> applying optimized cooling water treatment in water-cooled cooling systems to keep the heat transfer surfaces clean and avoid scaling, rusting, fouling, etc., so that in each individual case, the lowest energy consuming combination of the above factors must be achieved to operate the industrial cooling systems</p> <p><input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>
<p>(3) The methods to reduce direct energy consumption are provided as follows.</p> <p>Fans or pumps:</p> <p><1> matching motors with high efficiency <2> designing for optimum pressure loss and flow rate <3> using speed variators</p> <p><input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>
<p>(4) Operating the industrial cooling systems according to process requirements:</p> <p><1> water supply pressure <2> backwater pressure <3> temperature of water supply <4> temperature difference between the water supply and return water <5> pump efficiency <6> fan motor efficiency <7> point-of-use pressure requirements</p> <p><input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>

(16) Public facilities include: combustion handling systems; heat recovery systems; steam handling systems; electric power supply systems; electric motor drive subsystems; air compressor systems; pump systems; heating, ventilation and air conditioning systems; lighting systems; drying, separation, and concentration processing systems; industrial cooling systems. If the facility has the said public facilities, please select “Yes” and answer the following BAT items; if the facility does not have the said public facilities, answer “No” and explain why the facilities are not installed; no need to answer the BAT Items.

(iii) Co-generation system less than 50MW

<p>The item is whether the co-generation systems less than 50MW would be installed:</p> <p><input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 5 below.</p> <p><input type="checkbox"/> No. Description: (Reasons for not installing the system, no need to answer BAT Items 1 to 5 below.)</p>
<p>(1) System that generates effective thermal and electrical energy at the same time</p> <p><input type="checkbox"/> Applicable</p> <p><input type="checkbox"/> Partially applicable</p> <p><input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>
<p>(2) Steam turbines and the power generation system: considering the use of a computer-controlled system</p> <p><input type="checkbox"/> Applicable</p> <p><input type="checkbox"/> Partially applicable</p> <p><input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>
<p>(3) Steam turbines and the power generation system: considering the use of advanced materials</p> <p><input type="checkbox"/> Applicable</p> <p><input type="checkbox"/> Partially applicable</p> <p><input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>
<p>(4) Steam turbines and the power generation system: upgrading steam turbines requires a consideration of increasing steam temperature and pressure</p> <p><input type="checkbox"/> Applicable</p> <p><input type="checkbox"/> Partially applicable</p> <p><input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>
<p>(5) Steam turbines and the power generation system: optimizing working fluid operating conditions</p> <p><input type="checkbox"/> Applicable</p> <p><input type="checkbox"/> Partially applicable</p> <p><input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>

(For other matters requiring further explanation, please attach additional spaces to the chart)

iv. Energy Management Measures

Item	Description
<input type="checkbox"/> Energy Management System	(Ex: Plan to install energy management computer control system, plan to deploy energy management staff...)
<input type="checkbox"/> Green Energy Introduction	(Ex: Plan to install solar PV panels, plan to install wind turbines, plan to install solar water heater...etc.)
<input type="checkbox"/> Plant Facility Optimization	(Ex: Plan to obtain Green Factory or Green Building Certifications)
<input type="checkbox"/> Others	

(For other matters requiring further explanation, please attach additional spaces to the chart)

v. Appendix: Required Related Information and Documents

- (i) Letter of Approval for “Electricity Consumption Plan” / Explanation of self-usage power generation equipment: Please attach Letter of Approval for “Electricity Consumption Plan” / Explanation of self-usage power generation equipment.
- (ii) Other Related Information and Documents: Those adopting new processing techniques must provide qualitative or quantitative descriptions of efficiency greater than existing standards.