

Energy Utilization Manual

Format and Matters Required to be Provided

I. Energy Users as Electricity Generation

1. Format

- (1) 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.
- (2) 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.
- (3) 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.

2. Basic Information

Date: / /

(1) Basic Information of Applicant					
Plan Name					
Applicant ⁽¹⁾					
Responsible Person					
Address					
Contact					
Phone No.		Fax			
E-Mail					
Industrial Classification ⁽²⁾					
(2) Basic Information of Project					
A. 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
B. 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)
	Volume ⁽⁶⁾				<input type="checkbox"/> Private-Produced <input type="checkbox"/> External-Imported
	Completed Permit Application				
Category		<input type="checkbox"/> Petroleum Products ⁽⁷⁾ (kL/Year)			

		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Volume	Completed			
		Permit Application			
C. Rated thermal input ⁽⁸⁾ (MW _{th})					
D. Installed capacity (MW _e)					
E. Electrical efficiency ⁽⁹⁾ (% LHV)			F. 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 Standard Industrial Classification.

(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 Fongshan River and Heping River; Central refers to the region south of Fongshan River and norther of Jhuoshuei River, and Hualien County; Southern refers to the region south of Jhuoshuei 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 followed:

$$\eta_{net} = \frac{P_{el,net}}{m_{fuel}H_u} = \frac{P_{el,gross} - P_{aux}}{m_{fuel}H_u}$$

$P_{el,gross}$: Optimized maximum power output under design conditions (kWh) x 860 (kcal/kWh)

$P_{el,net}$: Net optimized maximum power output under design conditions (kWh) x 860 (kcal/kWh)

P_{aux} : Designed value for station service load (kWh) x 860 (kcal/kWh)

m_{fuel} : Total fuel input under design conditions

H_u : Fuel calorific value (kcal), LHV

(10) Fuel Utilization Equation is as followed:

$$\varepsilon_{net} = \frac{P_{el,net} + Q_{net}}{m_{fuel}H_u}$$

$P_{el,net}$: Net optimized maximum power output under design conditions (kWh) x 860 (kcal/kWh)

Q_{net} : Net optimized thermal output under design conditions (kcal)

m_{fuel} : Total fuel input under design conditions

H_u : Fuel calorific value (kcal), LHV

G. 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.

H. 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.

3. Information Checklist

Applicant Self-Checklist	
Review Items	Description
Processing Techniques	<p>1. In accordance with version of EU LCP: <u>BREF (2006)</u></p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No BATs Shall be Applied in Processing Techniques for Electricity Generation in Appendix 2 of Regulations Governing the Assessment of Energy Development and Utilization</p>
	<p>2. Energy Category</p>
	<p>Combustion of coal and/or lignite</p> <p>(1) Combustion: minimising the heat loss due to unburned gases and elements in solid wastes and residues from combustion</p> <p><input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>
	<p>(2) The highest possible pressure and temperature of medium pressure steam. Repeated superheating of the steam to increase net electric efficiency</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 highest possible pressure drop in the low pressure end of the steam turbine through the lowest possible temperature of the cooling water (fresh water cooling)</p> <p><input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>
	<p>(4) Minimising the heat loss through the flue-gas (utilisation of residual heat or district heating)</p> <p><input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>
	<p>(5) Minimising the heat loss through the slag</p> <p><input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable</p>

Applicant Self-Checklist	
Review Items	Description
	<p>Described as follows:</p>
	<p>(6) Minimising the heat loss through conduction and radiation with isolation</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>(7) Minimising the internal energy consumption by taking appropriate measures, e.g. scorification of the evaporator, greater efficiency of the feed-water pump, etc.</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>(8) Preheating the boiler feed-water with steam</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>(9) Improving blade geometry of the turbines</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>Combustion of liquid fuels</p>
	<p>(1) Combustion: minimising the heat loss due to unburned gases and elements in solid wastes and residues from combustion</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) The highest possible pressure and temperature of the working medium steam. Repeated superheating of the steam to increase net electric efficiency</p> <p><input type="checkbox"/> Applicable</p>

Applicant Self-Checklist	
Review Items	Description
	<input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(3) The highest possible pressure drop in the low pressure end of the steam turbine through the lowest possible temperature of the cooling water (fresh water cooling) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(4) Minimising the heat loss through the flue-gas (utilisation of residual heat or district heating) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(5) Minimising the heat loss through conduction and radiation with isolation <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(6) Minimising the internal energy consumption by taking appropriate measures, e.g. scorification of the evaporator, greater efficiency of the feed water pump etc. <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(7) Preheating the boiler feed water with steam <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(8) Improving blade geometry of the turbines

Applicant Self-Checklist

Review Items	Description	
		<input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	Combustion of gaseous fuels	(1) Combustion: minimising the heat loss due to unburned gases <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
		(2) The highest possible pressure and temperature of the working medium gas or steam <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
		(3) The highest possible pressure drop in the low pressure end of the steam turbine through the lowest possible temperature of the cooling water (fresh water cooling) for boilers and CCGT plants <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
		(4) Minimising the heat loss through the flue-gas (utilisation of residual heat or district heating) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
(5) Minimising the heat loss through conduction and radiation with isolation <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:		

Applicant Self-Checklist	
Review Items	Description
	<p>(6) Minimising the internal energy consumption by taking appropriate measures, e.g. scorification of the evaporator, greater efficiency of the feed water pump, etc.</p> <p><input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p> <p>(7) Preheating the fuel gas and or the boiler feed water with steam</p> <p><input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p> <p>(8) Improving blade geometry of the turbines</p> <p><input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p>
LHV	<p>1. In accordance with version of EU LCP: <u>BREF (2006)</u></p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No BATs Shall be Applied in Processing Techniques for Electricity Generation in Appendix 2 of Regulations Governing the Assessment of Energy Development and Utilization</p> <p>2. Energy Category: _____; Combustion technology: _____</p> <p>Electrical efficiency (% , LHV) of EU LCP: _____</p> <p>Electrical efficiency (% , LHV) of Planning unit: _____</p> <p><input type="checkbox"/> Conformity with electrical efficiency of EU LCP <input type="checkbox"/> Nonconformity with electrical efficiency of EU LCP</p> <p>Fuel utilization (% , LHV) of EU LCP: _____</p> <p>Fuel utilization (% , LHV) of Planning unit: _____</p> <p><input type="checkbox"/> Conformity with fuel utilization of EU LCP <input type="checkbox"/> Nonconformity with fuel utilization of EU LCP</p> <p>Described as follows:</p>
Utility Systems and Equipment ⁽¹³⁾	<p>1. In accordance with version of EU ENE: <u>BREF (2009)</u></p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No BATs Shall be Applied in Utility Systems and Equipment in Appendix 1 of Regulations Governing the Assessment of Energy Development and Utilization</p>

Applicant Self-Checklist

Review Items	Description							
	<p>2. The item is whether the combustion system would be installed: <input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 23 below. <input type="checkbox"/> No. Description: (Reasons for no installing system, no need to answer BAT Items 1 to 23 below.)</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td data-bbox="402 443 603 2022" rowspan="6" style="vertical-align: top; padding: 5px;"> Combustion system </td> <td data-bbox="609 443 1412 696" style="padding: 5px;"> <p>(1) Lignite pre-drying <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p> </td> </tr> <tr> <td data-bbox="609 705 1412 958" style="padding: 5px;"> <p>(2) Coal gasification <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p> </td> </tr> <tr> <td data-bbox="609 967 1412 1220" style="padding: 5px;"> <p>(3) Fuel drying <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p> </td> </tr> <tr> <td data-bbox="609 1229 1412 1482" style="padding: 5px;"> <p>(4) Biomass gasification <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p> </td> </tr> <tr> <td data-bbox="609 1491 1412 1744" style="padding: 5px;"> <p>(5) Bark pressing <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p> </td> </tr> <tr> <td data-bbox="609 1753 1412 2007" style="padding: 5px;"> <p>(6) Expansion turbine to recover the energy content of pressurized gases <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p> </td> </tr> </table>	Combustion system	<p>(1) Lignite pre-drying <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p>	<p>(2) Coal gasification <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p>	<p>(3) Fuel drying <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p>	<p>(4) Biomass gasification <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p>	<p>(5) Bark pressing <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p>	<p>(6) Expansion turbine to recover the energy content of pressurized gases <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p>
Combustion system	<p>(1) Lignite pre-drying <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p>							
	<p>(2) Coal gasification <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p>							
	<p>(3) Fuel drying <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p>							
	<p>(4) Biomass gasification <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p>							
	<p>(5) Bark pressing <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p>							
	<p>(6) Expansion turbine to recover the energy content of pressurized gases <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p>							

Applicant Self-Checklist

Review Items	Description
	<p>(7) Advanced computerised control of combustion conditions for emission reduction and boiler performance</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>(8) Use of the heat content of the flue-gas for district heating</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>(9) Low excess air</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>(10) Lowering of exhaust gas temperatures</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>(11) Low CO concentration in the flue-gas</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>(12) Heat accumulation</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>(13) Cooling tower discharge</p> <p><input type="checkbox"/> Applicable</p> <p><input type="checkbox"/> Partially applicable</p> <p><input type="checkbox"/> Not applicable</p>

Applicant Self-Checklist

Review Items	Description
	<p align="center">Described as follows:</p> <hr/> <p>(14) Different techniques for the cooling 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> <hr/> <p>(15) Preheating of fuel gas by using waste heat</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> <hr/> <p>(16) Preheating of combustion air</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> <hr/> <p>(17) Recuperative and regenerative burners</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> <hr/> <p>(18) Burner regulation and control</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> <hr/> <p>(19) Fuel choice</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> <hr/> <p>(20) Oxy-firing (oxyfuel)</p> <p><input type="checkbox"/> Applicable</p> <p><input type="checkbox"/> Partially applicable</p>

Applicant Self-Checklist	
Review Items	Description
	<input type="checkbox"/> Not applicable Described as follows:
	(21) Reducing heat losses by insulation <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(22) Reducing losses through furnace doors <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(23) Fluidised bed combustion <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	3. The item is whether the steam system would be installed: <input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 28 below. <input type="checkbox"/> No. Description: (Reasons for no installing system, no need to answer BAT Items 1 to 28 below.)
Steam systems	(1) Energy efficient design and installation of steam distribution pipework <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(2) Throttling devices and the use of backpressure turbines: utilize backpressure turbines instead of PRVs <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(3) Improve operating procedures and boiler controls <input type="checkbox"/> Applicable

Applicant Self-Checklist

Review Items	Description
	<div data-bbox="667 273 954 394"> <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: </div> <hr/> <div data-bbox="619 448 1369 694"> (4) Use sequential boiler controls (apply only to sites with more than one boiler) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: </div> <hr/> <div data-bbox="619 748 1410 994"> (5) Install flue-gas isolation dampers (applicable only to sites with more than one boiler) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: </div> <hr/> <div data-bbox="619 1048 1369 1464"> (6) Preheat feed-water by using: <ul style="list-style-type: none"> • waste heat • economisers using combustion air • deaerated feed-water to heat condensate • condensing the steam used for stripping and heating the feed water to the deaerator via a heat exchanger <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: </div> <hr/> <div data-bbox="619 1518 1404 1765"> (7) Prevention and removal of scale deposits on heat transfer surfaces. (Clean boiler heat transfer surfaces) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: </div> <hr/> <div data-bbox="619 1818 1401 2016"> (8) Minimise boiler blowdown by improving water treatment. Install automatic total dissolved solids control <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable </div>

Applicant Self-Checklist	
Review Items	Description
	<p>Described as follows:</p>
	<p>(9) Add/restore boiler refractory</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>(10) Optimise deaerator vent rate</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>(11) Minimise boiler short cycling losses</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>(12) Carrying out boiler maintenance</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>(13) Optimise steam distribution systems (especially to cover the issues below)</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>(14) Isolate steam from unused lines</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>(15) Insulation on steam pipes and condensate return pipes. (Ensure that steam system piping, valves, fittings and</p>

Applicant Self-Checklist

Review Items	Description
	<p>vessels are well insulated) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p> <hr/> <p>(16) Implement a control and repair programme for steam traps <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p> <hr/> <p>(17) Collect and return condensate to the boiler for re-use. (Optimise condensate recovery) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p> <hr/> <p>(18) Re-use of flash-steam. (Use high pressure condensate to make low pressure steam) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p> <hr/> <p>(19) Re-use of flash-steam. (Use high pressure condensate to make low pressure steam) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p> <hr/> <p>(20) Expansion turbine to recover the energy content of pressurised gases <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p>

Applicant Self-Checklist	
Review Items	Description
	<p>(21) Change turbine blades</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>(22) Use advanced materials to reach high steam parameters</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>(23) Supercritical steam parameters</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>(24) Double reheat</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>(25) Regenerative feed-water</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>(26) Use of heat content of the flue-gas for district heating</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>(27) Heat accumulation</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	
Review Items	Description
	<p>(28) Advanced computerised control of the gas turbine and subsequent recovery boilers</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. The item is whether the heat recovery system would be installed:</p> <p><input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 2 below.</p> <p><input type="checkbox"/> No. Description: (Reasons for no installing system, no need to answer BAT Items 1 to 2 below.)</p>
Heat recovery systems	<p>(1) Monitoring the efficiency periodically</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) Preventing or removing fouling</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. The item is whether the electrical power supply system would be installed ⁽¹⁴⁾:</p> <p><input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 8 below.</p> <p><input type="checkbox"/> No. Description: (Reasons for no installing system, no need to answer BAT Items 1 to 8 below.)</p>
Electrical power supply system	<p>(1) Installing capacitors in the AC circuits to decrease the magnitude of reactive power</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) Minimising the operation of idling or lightly loaded motors</p> <p><input type="checkbox"/> Applicable</p> <p><input type="checkbox"/> Partially applicable</p> <p><input type="checkbox"/> Not applicable</p>

Applicant Self-Checklist

Review Items	Description
	<p align="center">Described as follows:</p> <hr/> <p>(3) Avoiding the operation of equipment above its rated voltage</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> <hr/> <p>(4) Using energy efficient motors</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> <hr/> <p>(5) Ensure power cables have the correct dimensions for the power demand</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> <hr/> <p>(6) Keep online transformer(s) operating at a load above 40 ~50 % of the rated power</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> <hr/> <p>(7) Use high efficiency/low loss transformers</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> <hr/> <p>(8) Place equipment with a high current demand as close as possible to the power source (e.g. transformer)</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

Review Items	Description							
	<p data-bbox="408 322 1406 394">6. The item is whether the electric motor driven sub-systems would be installed:</p> <p data-bbox="464 405 1278 436"><input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 7 below.</p> <p data-bbox="464 448 1406 519"><input type="checkbox"/> No. Description: (Reasons for no installing system, no need to answer BAT Items 1 to 7 below.)</p> <table border="1" data-bbox="408 530 1406 2018"> <tr> <td data-bbox="408 530 603 2018" rowspan="6">electric motor driven sub-systems</td> <td data-bbox="609 530 1406 779"> <p data-bbox="616 539 1150 571">(1) Using energy efficient motors (EEM)</p> <p data-bbox="667 580 847 611"><input type="checkbox"/> Applicable</p> <p data-bbox="667 620 954 651"><input type="checkbox"/> Partially applicable</p> <p data-bbox="667 660 895 692"><input type="checkbox"/> Not applicable</p> <p data-bbox="667 701 946 732">Described as follows:</p> </td> </tr> <tr> <td data-bbox="609 788 1406 1037"> <p data-bbox="616 797 922 828">(2) Proper motor sizing</p> <p data-bbox="667 837 847 869"><input type="checkbox"/> Applicable</p> <p data-bbox="667 878 954 909"><input type="checkbox"/> Partially applicable</p> <p data-bbox="667 918 895 949"><input type="checkbox"/> Not applicable</p> <p data-bbox="667 958 946 990">Described as follows:</p> </td> </tr> <tr> <td data-bbox="609 1046 1406 1294"> <p data-bbox="616 1055 1273 1086">(3) Installing high efficiency transmission/ educers</p> <p data-bbox="667 1095 847 1126"><input type="checkbox"/> Applicable</p> <p data-bbox="667 1135 954 1167"><input type="checkbox"/> Partially applicable</p> <p data-bbox="667 1176 895 1207"><input type="checkbox"/> Not applicable</p> <p data-bbox="667 1216 946 1247">Described as follows:</p> </td> </tr> <tr> <td data-bbox="609 1303 1406 1630"> <p data-bbox="616 1312 1406 1420">(4) Use: direct coupling where possible, synchronous belts or cogged V-belts in place of V belts, helical gears in place of worm gears</p> <p data-bbox="667 1429 847 1460"><input type="checkbox"/> Applicable</p> <p data-bbox="667 1469 954 1500"><input type="checkbox"/> Partially applicable</p> <p data-bbox="667 1509 895 1541"><input type="checkbox"/> Not applicable</p> <p data-bbox="667 1550 946 1581">Described as follows:</p> </td> </tr> <tr> <td data-bbox="609 1639 1406 1933"> <p data-bbox="616 1648 1406 1720">(5) Rewinding: avoid rewinding and replace with an EEM, or use a certified rewinding contractor (EEMR)</p> <p data-bbox="667 1729 847 1760"><input type="checkbox"/> Applicable</p> <p data-bbox="667 1769 954 1800"><input type="checkbox"/> Partially applicable</p> <p data-bbox="667 1809 895 1841"><input type="checkbox"/> Not applicable</p> <p data-bbox="667 1850 946 1881">Described as follows:</p> </td> </tr> <tr> <td data-bbox="609 1942 1406 2018"> <p data-bbox="616 1951 946 1982">(6) Power quality control</p> <p data-bbox="667 1991 847 2022"><input type="checkbox"/> Applicable</p> </td> </tr> </table>	electric motor driven sub-systems	<p data-bbox="616 539 1150 571">(1) Using energy efficient motors (EEM)</p> <p data-bbox="667 580 847 611"><input type="checkbox"/> Applicable</p> <p data-bbox="667 620 954 651"><input type="checkbox"/> Partially applicable</p> <p data-bbox="667 660 895 692"><input type="checkbox"/> Not applicable</p> <p data-bbox="667 701 946 732">Described as follows:</p>	<p data-bbox="616 797 922 828">(2) Proper motor sizing</p> <p data-bbox="667 837 847 869"><input type="checkbox"/> Applicable</p> <p data-bbox="667 878 954 909"><input type="checkbox"/> Partially applicable</p> <p data-bbox="667 918 895 949"><input type="checkbox"/> Not applicable</p> <p data-bbox="667 958 946 990">Described as follows:</p>	<p data-bbox="616 1055 1273 1086">(3) Installing high efficiency transmission/ educers</p> <p data-bbox="667 1095 847 1126"><input type="checkbox"/> Applicable</p> <p data-bbox="667 1135 954 1167"><input type="checkbox"/> Partially applicable</p> <p data-bbox="667 1176 895 1207"><input type="checkbox"/> Not applicable</p> <p data-bbox="667 1216 946 1247">Described as follows:</p>	<p data-bbox="616 1312 1406 1420">(4) Use: direct coupling where possible, synchronous belts or cogged V-belts in place of V belts, helical gears in place of worm gears</p> <p data-bbox="667 1429 847 1460"><input type="checkbox"/> Applicable</p> <p data-bbox="667 1469 954 1500"><input type="checkbox"/> Partially applicable</p> <p data-bbox="667 1509 895 1541"><input type="checkbox"/> Not applicable</p> <p data-bbox="667 1550 946 1581">Described as follows:</p>	<p data-bbox="616 1648 1406 1720">(5) Rewinding: avoid rewinding and replace with an EEM, or use a certified rewinding contractor (EEMR)</p> <p data-bbox="667 1729 847 1760"><input type="checkbox"/> Applicable</p> <p data-bbox="667 1769 954 1800"><input type="checkbox"/> Partially applicable</p> <p data-bbox="667 1809 895 1841"><input type="checkbox"/> Not applicable</p> <p data-bbox="667 1850 946 1881">Described as follows:</p>	<p data-bbox="616 1951 946 1982">(6) Power quality control</p> <p data-bbox="667 1991 847 2022"><input type="checkbox"/> Applicable</p>
electric motor driven sub-systems	<p data-bbox="616 539 1150 571">(1) Using energy efficient motors (EEM)</p> <p data-bbox="667 580 847 611"><input type="checkbox"/> Applicable</p> <p data-bbox="667 620 954 651"><input type="checkbox"/> Partially applicable</p> <p data-bbox="667 660 895 692"><input type="checkbox"/> Not applicable</p> <p data-bbox="667 701 946 732">Described as follows:</p>							
	<p data-bbox="616 797 922 828">(2) Proper motor sizing</p> <p data-bbox="667 837 847 869"><input type="checkbox"/> Applicable</p> <p data-bbox="667 878 954 909"><input type="checkbox"/> Partially applicable</p> <p data-bbox="667 918 895 949"><input type="checkbox"/> Not applicable</p> <p data-bbox="667 958 946 990">Described as follows:</p>							
	<p data-bbox="616 1055 1273 1086">(3) Installing high efficiency transmission/ educers</p> <p data-bbox="667 1095 847 1126"><input type="checkbox"/> Applicable</p> <p data-bbox="667 1135 954 1167"><input type="checkbox"/> Partially applicable</p> <p data-bbox="667 1176 895 1207"><input type="checkbox"/> Not applicable</p> <p data-bbox="667 1216 946 1247">Described as follows:</p>							
	<p data-bbox="616 1312 1406 1420">(4) Use: direct coupling where possible, synchronous belts or cogged V-belts in place of V belts, helical gears in place of worm gears</p> <p data-bbox="667 1429 847 1460"><input type="checkbox"/> Applicable</p> <p data-bbox="667 1469 954 1500"><input type="checkbox"/> Partially applicable</p> <p data-bbox="667 1509 895 1541"><input type="checkbox"/> Not applicable</p> <p data-bbox="667 1550 946 1581">Described as follows:</p>							
	<p data-bbox="616 1648 1406 1720">(5) Rewinding: avoid rewinding and replace with an EEM, or use a certified rewinding contractor (EEMR)</p> <p data-bbox="667 1729 847 1760"><input type="checkbox"/> Applicable</p> <p data-bbox="667 1769 954 1800"><input type="checkbox"/> Partially applicable</p> <p data-bbox="667 1809 895 1841"><input type="checkbox"/> Not applicable</p> <p data-bbox="667 1850 946 1881">Described as follows:</p>							
	<p data-bbox="616 1951 946 1982">(6) Power quality control</p> <p data-bbox="667 1991 847 2022"><input type="checkbox"/> Applicable</p>							

Applicant Self-Checklist	
Review Items	Description
	<input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(7) Lubrication, adjustments, tuning <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	7. The item is whether the compressed air systems would be installed: <input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 13 below. <input type="checkbox"/> No. Description: (Reasons for no installing system, no need to answer BAT Items 1 to 13 below.)
Compressed air systems	(1) Overall system design, including multi-pressure systems <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(2) Improve cooling, drying and filtering <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(3) Reduce frictional pressure losses (for example by increasing pipe diameter) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(4) Improvement of drives (high efficiency motors) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(5) Improvement of drives (speed control) <input type="checkbox"/> Applicable

Applicant Self-Checklist

Review Items	Description
	<p><input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p>
	<p>(6) Use of sophisticated control systems <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p>
	<p>(7) Recover waste heat for use in other functions <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p>
	<p>(8) Use external cool air as intake <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p>
	<p>(9) Storage of compressed air near highly-fluctuating uses <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p>
	<p>(10) Optimise certain end use devices <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p>
	<p>(11) Reduce air leaks <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p>
	<p>(12) More frequent filter replacement</p>

Applicant Self-Checklist

Review Items	Description	
		<input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
		(13) Optimise working pressure <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	8. The item is whether the pumping systems would be installed: <input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 11 below. <input type="checkbox"/> No. Description: (Reasons for no installing system, no need to answer BAT Items 1 to 11 below.)	
	Pumping systems	(1) Avoid oversizing when selecting pumps and replace oversized pumps <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
		(2) Match the correct choice of pump to the correct motor for the duty <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
		(3) Design of pipework system <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
		(4) Control and regulation system <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:

Applicant Self-Checklist

Review Items	Description
	<p>(5) Shut down unnecessary pumps</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>(6) Use of variable speed drives (VSDs)</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>(7) Use of multiple pumps (staged cut in)</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>(8) Regular maintenance. Where unplanned maintenance becomes excessive, check for: cavitation, wear, wrong type of pump</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>(9) Minimise the number of valves and bends commensurate with keeping ease of operation and maintenance</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>(10) Avoiding using too many bends (especially tight bends)</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>(11) Ensuring the pipework diameter is not too small (correct pipework diameter)</p>

Applicant Self-Checklist	
Review Items	Description
	<input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	9. The item is whether the heating, ventilation and air conditioning (HVAC) systems would be installed: <input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 11 below. <input type="checkbox"/> No. Description: (Reasons for no installing system, no need to answer BAT Items 1 to 11 below.)
Heating, ventilation and air conditioning (HVAC) systems	(1) Overall system design. Identify and equip areas separately for: <ul style="list-style-type: none"> • general ventilation • specific ventilation • process ventilation <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(2) Optimise the number, shape and size of intakes <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(3) Use fans: <ul style="list-style-type: none"> • of high efficiency • designed to operate at optimal rate <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(4) Manage airflow, including considering dual flow ventilation <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:

Applicant Self-Checklist

Review Items	Description
	<p>(5) Air system design:</p> <ul style="list-style-type: none"> • ducts are of a sufficient size • circular ducts • avoid long runs and obstacles such as bends, narrow sections <p><input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable</p> <p>Described as follows:</p> <hr/> <p>(6) Optimise electric motors, and consider installing a VSD</p> <p><input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable</p> <p>Described as follows:</p> <hr/> <p>(7) Use automatic control systems. Integrate with centralised technical management systems</p> <p><input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable</p> <p>Described as follows:</p> <hr/> <p>(8) Integration of air filters into air duct system and heat recovery from exhaust air (heat exchangers)</p> <p><input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable</p> <p>Described as follows:</p> <hr/> <p>(9) Reduce heating/cooling needs by:</p> <ul style="list-style-type: none"> • building insulation • efficient glazing • air infiltration reduction • automatic closure of doors • destratification • lowering of temperature set point during non-production period (programmable regulation) • reduction of the set point for heating and raising it for cooling <p><input type="checkbox"/> Applicable</p>

Applicant Self-Checklist	
Review Items	Description
	<input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(10) Improve the efficiency of heating systems through: <ul style="list-style-type: none"> • recovery or use of wasted heat • heat pumps • radiative and local heating systems coupled with reduced temperature set points in the non occupied areas of the buildings <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(11) Improve the efficiency of cooling systems through the use of free cooling <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	10. The item is whether the lighting systems would be installed: <input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 5 below. <input type="checkbox"/> No. Description: (Reasons for no installing system, no need to answer BAT Items 1 to 5 below.)
Lighting systems	(1) Identify illumination requirements in terms of both intensity and spectral content required for the intended task <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(2) Plan space and activities in order to optimise the use of natural light <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:

Applicant Self-Checklist

Review Items	Description	
		<p>(3) Selection of fixtures and lamps according to specific requirements for the intended use</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> <hr/> <p>(4) Use of lighting management control systems including occupancy sensors, timers, etc.</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> <hr/> <p>(5) Train building occupants to utilise lighting equipment in the most efficient manner</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>11. The item is whether the drying, separation, and concentration processes would be installed:</p> <p><input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 11 below.</p> <p><input type="checkbox"/> No. Description: (Reasons for no installing system, no need to answer BAT Items 1 to 11 below.)</p>	
	<p>Drying, separation, and concentration processes</p>	<p>(1) Select the optimum separation technology or combination of techniques (below) to meet the specific process equipments</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> <hr/> <p>(2) Use of surplus heat from other processes</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> <hr/> <p>(3) Use a combination of techniques</p>

Applicant Self-Checklist	
Review Items	Description
	<input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(4) Mechanical processes, e.g. filtration, membrane filtration <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(5) Thermal processes <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(6) Direct drying <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(7) Superheated steam <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(8) Heat recovery (including MVR and heat pumps) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(9) Optimise insulation of the drying system <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:

Applicant Self-Checklist	
Review Items	Description
	<p>(10) Radiation processes</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>(11) Process automation in thermal drying processes</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)

(13) Public facilities include: combustion systems; pumping systems; steam systems; heating, ventilation and air conditioning (HVAC) systems; heat recovery systems; lighting systems; electrical power supply systems; drying, separation, and concentration processes; electric motor driven sub-systems; compressed air 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.

4. 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)

5. Appendix: Required Related Information and Documents

- (1) Fuel Sources: The source of supply of the required energy category of the generating equipment.
- (2) 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

1. Format

- (1) 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.
- (2) 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.
- (3) 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.

2. Basic Information

Date: / /

(1) Basic Information of Applicant					
Plan Name					
Applicant ⁽¹⁾					
Responsible Person					
Address					
Contact					
Phone No.		Fax			
E-Mail					
Industrial Classification ⁽²⁾					
(2) Basic Information of Project					
A. 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
	<input type="checkbox"/> Yes <input type="checkbox"/> No the Self-Use Power Generation Equipment is installed jointly by several applicants ⁽⁶⁾				
B. 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⁾		Completed Permit			

	Application				
	Category	<input type="checkbox"/> Petroleum Products ⁽⁸⁾ (kL/Year)			
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Volume	Completed			
		Permit Application			
C. Rated thermal input ⁽⁹⁾ (MW _{th})					
D. Installed capacity (MW _e)					
E. effective thermal ratio (%) ⁽¹⁰⁾					
F. Electrical efficiency ⁽¹¹⁾ (% , LHV)			G. 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 Standard Industrial Classification.

(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 Fongshan River and Heping River; Central refers to the region south of Fongshan River and norther of Jhuoshuei River, and Hualien County; Southern refers to the region south of Jhuoshuei 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 followed:

$$\eta_{net} = \frac{P_{el,net}}{m_{fuel}H_u} = \frac{P_{el,gross} - P_{aux}}{m_{fuel}H_u}$$

$P_{el,gross}$: Optimized maximum power output under design conditions (kWh) x 860 (kcal/kWh)

$P_{el,net}$: Net optimized maximum power output under design conditions (kWh) x 860 (kcal/kWh)

P_{aux} : Designed value for station service load (kWh) x 860 (kcal/kWh)

m_{fuel} : Total fuel input under design conditions

H_u : Fuel calorific value (kcal), LHV

(12) Fuel Utilization Equation is as followed:

$$\epsilon_{net} = \frac{P_{el,net} + Q_{net}}{m_{fuel}H_u}$$

$P_{el,net}$: Net optimized maximum power output under design conditions (kWh) x 860 (kcal/kWh)

Q_{net} : Net optimized thermal output under design conditions (kcal)

m_{fuel} : Total fuel input under design conditions

H_u : Fuel calorific value (kcal), LHV

H. 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.

I. 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.

3. Information Checklist

Applicant Self-Checklist	
Review Items	Description
Processing Techniques	1. In accordance with version of EU LCP: <u>BREF D1 (2013)</u> <input type="checkbox"/> Yes <input type="checkbox"/> No BATs Shall be Applied in Processing Techniques for Cogeneration Systems in Appendix 2 of Regulations Governing the Assessment of Energy Development and Utilization
	2. In order to increase the energy efficiency of combustion plants, BAT is to use an appropriate combination of the techniques given below:
	(1) Ultra supercritical Steam conditions <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(2) Supercritical steam conditions <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(3) Optimisation of the working medium conditions <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(4) Optimisation of the steam cycle <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(5) Heat recovery by cogeneration, CHP <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
(6) Regenerative feed-water heating <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable	

Applicant Self-Checklist

Review Items	Description
	Described as follows:
	(7) Preheating of combustion air <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(8) Steam turbine upgrades <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(9) Steam turbine upgrades <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(10) Cooling tower discharge <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(11) Wet stack <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(12) Fuel predrying <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(13) Fuel preheating <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable

Applicant Self-Checklist

Review Items	Description
	<input type="checkbox"/> Not applicable Described as follows:
	(14) Complete combustion <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(15) Heat accumulation <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(16) Advanced materials <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(17) Minimisation of heat losses <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(18) Minimisation of energy consumption <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(19) Flue-gas condenser <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(20) CHP readiness <input type="checkbox"/> Applicable

Applicant Self-Checklist

Review Items	Description		
	<input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:		
	3. Energy Category		
	<input type="checkbox"/> the combustion of solid fuels	(1) Lignite pre-drying <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:	
	<input type="checkbox"/> the combustion of liquid fuels	<input type="checkbox"/> the HFO and LFO combustion in boilers	(1) Preheating of fuel by using waste heat <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: (2) Regenerative feed-water heating by using recovered heat <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: (3) Supercritical steam parameters <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: (4) Preheating of combustion air by using recovered heat <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
		<input type="checkbox"/> HFO-fired engines	(1) Preheating of fuel by using waste heat <input type="checkbox"/> Applicable

Applicant Self-Checklist

Review Items	Description	
		<div style="border-bottom: 1px solid black; padding: 5px;"> <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: </div> <div style="border-bottom: 1px solid black; padding: 5px;"> (2) Preheating of combustion air using waste heat <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: </div> <div style="border-bottom: 1px solid black; padding: 5px;"> (3) Combined cycle <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: </div> <div style="border-bottom: 1px solid black; padding: 5px;"> <input type="checkbox"/> LFO-fired gas turbines </div> <div style="border-bottom: 1px solid black; padding: 5px;"> (1) Double reheat <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: </div> <div style="padding: 5px;"> (2) Combined cycle, CCGT <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: </div>
	<input type="checkbox"/> the combustion of gaseous fuels	<div style="border-bottom: 1px solid black; padding: 5px;"> (1) CHP readiness <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: </div> <div style="padding: 5px;"> (2) Regenerative feed-water heating <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: </div>

Applicant Self-Checklist		
Review Items	Description	
		(3) Combined cycle, CCGT <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
LHV	1. In accordance with version of EU LCP: <u>BREF D1 (2013)</u> <input type="checkbox"/> Yes <input type="checkbox"/> No BATs Shall be Applied in Processing Techniques for Cogeneration Systems in Appendix 2 of Regulations Governing the Assessment of Energy Development and Utilization	
	2. Energy Category: _____; Combustion technology: _____ Electrical efficiency (% , LHV) of EU LCP: _____ Electrical efficiency (% , LHV) of Planning unit: _____ <input type="checkbox"/> Conformity with electrical efficiency of EU LCP <input type="checkbox"/> Nonconformity with electrical efficiency of EU LCP Fuel utilization (% , LHV) of EU LCP: _____ Fuel utilization (% , LHV) of Planning unit: _____ <input type="checkbox"/> Conformity with fuel utilization of EU LCP <input type="checkbox"/> Nonconformity with fuel utilization of EU LCP Described as follows:	
Utility Systems and Equipment ⁽¹⁵⁾	1. In accordance with version of EU ENE: <u>BREF (2009)</u> <input type="checkbox"/> Yes <input type="checkbox"/> No BATs Shall be Applied in Utility Systems and Equipment in Appendix 1 of Regulations Governing the Assessment of Energy Development and Utilization	
	2. The item is whether the combustion system would be installed: <input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 23 below. <input type="checkbox"/> No. Description: (Reasons for no installing system, no need to answer BAT Items 1 to 23 below.)	
	Combustion system	(1) Lignite pre-drying <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
		(2) Coal gasification <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:

Applicant Self-Checklist

Review Items	Description
	<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>
	<p>(6) Expansion turbine to recover the energy content of pressurized gases</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>(7) Advanced computerised control of combustion conditions for emission reduction and boiler performance</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>(8) Use of the heat content of the flue-gas for district heating</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>(9) Low excess air</p> <p><input type="checkbox"/> Applicable</p> <p><input type="checkbox"/> Partially applicable</p>

Applicant Self-Checklist

Review Items	Description
	<input type="checkbox"/> Not applicable Described as follows:
	(10) Lowering of exhaust gas temperatures <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(11) Low CO concentration in the flue-gas <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(12) Heat accumulation <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(13) Cooling tower discharge <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(14) Different techniques for the cooling system <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(15) Preheating of fuel gas by using waste heat <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(16) Preheating of combustion air <input type="checkbox"/> Applicable

Applicant Self-Checklist

Review Items	Description
	<p><input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p>
	<p>(17) Recuperative and regenerative burners <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p>
	<p>(18) Burner regulation and control <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p>
	<p>(19) Fuel choice <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p>
	<p>(20) Oxy-firing (oxyfuel) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p>
	<p>(21) Reducing heat losses by insulation <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p>
	<p>(22) Reducing losses through furnace doors <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p>
	<p>(23) Fluidised bed combustion</p>

Applicant Self-Checklist	
Review Items	Description
	<input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	3. The item is whether the steam system would be installed: <input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 28 below. <input type="checkbox"/> No. Description: (Reasons for no installing system, no need to answer BAT Items 1 to 28 below.)
Steam systems	(1) Energy efficient design and installation of steam distribution pipework <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(2) Throttling devices and the use of backpressure turbines: utilize backpressure turbines instead of PRVs <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(3) Improve operating procedures and boiler controls <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(4) Use sequential boiler controls (apply only to sites with more than one boiler) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(5) Install flue-gas isolation dampers (applicable only to sites with more than one boiler) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable

Applicant Self-Checklist

Review Items	Description
	<p align="center">Described as follows:</p> <hr/> <p>(6) Preheat feed-water by using:</p> <ul style="list-style-type: none"> • waste heat • economisers using combustion air • deaerated feed-water to heat condensate • condensing the steam used for stripping and heating the feed water to the deaerator via a heat exchanger <p> <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable </p> <p align="center">Described as follows:</p> <hr/> <p>(7) Prevention and removal of scale deposits on heat transfer surfaces. (Clean boiler heat transfer surfaces)</p> <p> <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable </p> <p align="center">Described as follows:</p> <hr/> <p>(8) Minimise boiler blowdown by improving water treatment. Install automatic total dissolved solids control</p> <p> <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable </p> <p align="center">Described as follows:</p> <hr/> <p>(9) Add/restore boiler refractory</p> <p> <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable </p> <p align="center">Described as follows:</p> <hr/> <p>(10) Optimise deaerator vent rate</p> <p> <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable </p> <p align="center">Described as follows:</p> <hr/> <p>(11) Minimise boiler short cycling losses</p> <p> <input type="checkbox"/> Applicable </p>

Applicant Self-Checklist

Review Items	Description
	<p><input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p>
	<p>(12) Carrying out boiler maintenance <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p>
	<p>(13) Optimise steam distribution systems (especially to cover the issues below) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p>
	<p>(14) Isolate steam from unused lines <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p>
	<p>(15) Insulation on steam pipes and condensate return pipes. (Ensure that steam system piping, valves, fittings and vessels are well insulated) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p>
	<p>(16) Implement a control and repair programme for steam traps <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p>
	<p>(17) Collect and return condensate to the boiler for re-use. (Optimise condensate recovery) <input type="checkbox"/> Applicable</p>

Applicant Self-Checklist

Review Items	Description
	<div data-bbox="678 275 965 394"> <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: </div> <hr/> <div data-bbox="619 450 1406 696"> (18) Re-use of flash-steam. (Use high pressure condensate to make low pressure steam) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: </div> <hr/> <div data-bbox="619 745 1406 992"> (19) Re-use of flash-steam. (Use high pressure condensate to make low pressure steam) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: </div> <hr/> <div data-bbox="619 1041 1337 1288"> (20) Expansion turbine to recover the energy content of pressurised gases <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: </div> <hr/> <div data-bbox="619 1337 965 1543"> (21) Change turbine blades <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: </div> <hr/> <div data-bbox="619 1592 1398 1798"> (22) Use advanced materials to reach high steam parameters <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: </div> <hr/> <div data-bbox="619 1848 1077 2016"> (23) Supercritical steam parameters <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable </div>

Applicant Self-Checklist

Review Items	Description	
		Described as follows:
		(24) Double reheat <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
		(25) Regenerative feed-water <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
		(26) Use of heat content of the flue-gas for district heating <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
		(27) Heat accumulation <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
		(28) Advanced computerised control of the gas turbine and subsequent recovery boilers <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	4. The item is whether the heat recovery system would be installed: <input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 2 below. <input type="checkbox"/> No. Description: (Reasons for no installing system, no need to answer BAT Items 1 to 2 below.)	
	Heat recovery systems	(1) Monitoring the efficiency periodically <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable

Applicant Self-Checklist

Review Items	Description	
		<p align="center">Described as follows:</p> <hr/> <p>(2) Preventing or removing fouling</p> <p><input type="checkbox"/> Applicable</p> <p><input type="checkbox"/> Partially applicable</p> <p><input type="checkbox"/> Not applicable</p> <p align="center">Described as follows:</p>
	<p>5. The item is whether the electrical power supply system would be installed ⁽¹⁶⁾:</p> <p><input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 8 below.</p> <p><input type="checkbox"/> No. Description: (Reasons for no installing system, no need to answer BAT Items 1 to 8 below.)</p>	
	<p>Electrical power supply system</p>	<p>(1) Installing capacitors in the AC circuits to decrease the magnitude of reactive power</p> <p><input type="checkbox"/> Applicable</p> <p><input type="checkbox"/> Partially applicable</p> <p><input type="checkbox"/> Not applicable</p> <p align="center">Described as follows:</p> <hr/> <p>(2) Minimising the operation of idling or lightly loaded motors</p> <p><input type="checkbox"/> Applicable</p> <p><input type="checkbox"/> Partially applicable</p> <p><input type="checkbox"/> Not applicable</p> <p align="center">Described as follows:</p> <hr/> <p>(3) Avoiding the operation of equipment above its rated voltage</p> <p><input type="checkbox"/> Applicable</p> <p><input type="checkbox"/> Partially applicable</p> <p><input type="checkbox"/> Not applicable</p> <p align="center">Described as follows:</p> <hr/> <p>(4) Using energy efficient motors</p> <p><input type="checkbox"/> Applicable</p> <p><input type="checkbox"/> Partially applicable</p> <p><input type="checkbox"/> Not applicable</p> <p align="center">Described as follows:</p> <hr/> <p>(5) Ensure power cables have the correct dimensions for the</p>

Applicant Self-Checklist	
Review Items	Description
	<p>power demand</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>(6) Keep online transformer(s) operating at a load above 40 ~50 % of the rated power</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>(7) Use high efficiency/low loss transformers</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>(8) Place equipment with a high current demand as close as possible to the power source (e.g. transformer)</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>6. The item is whether the electric motor driven sub-systems would be installed:</p> <p><input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 7 below.</p> <p><input type="checkbox"/> No. Description: (Reasons for no installing system, no need to answer BAT Items 1 to 7 below.)</p>
electric motor driven sub-systems	<p>(1) Using energy efficient motors (EEM)</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) Proper motor sizing</p> <p><input type="checkbox"/> Applicable</p> <p><input type="checkbox"/> Partially applicable</p> <p><input type="checkbox"/> Not applicable</p>

Applicant Self-Checklist

Review Items		Description
		<p>Described as follows:</p>
		<p>(3) Installing high efficiency transmission/ educers</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) Use: direct coupling where possible, synchronous belts or cogged V-belts in place of V belts, helical gears in place of worm gears</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) Rewinding: avoid rewinding and replace with an EEM, or use a certified rewinding contractor (EEMR)</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>(6) Power quality control</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>(7) Lubrication, adjustments, tuning</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>7. The item is whether the compressed air systems would be installed:</p> <p><input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 13 below.</p> <p><input type="checkbox"/> No. Description: (Reasons for no installing system, no need to answer BAT Items 1 to 13 below.)</p>
	Compressed air systems	<p>(1) Overall system design, including multi-pressure systems</p> <p><input type="checkbox"/> Applicable</p>

Applicant Self-Checklist

Review Items	Description
	<p> <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: </p>
	<p> (2) Improve cooling, drying and filtering <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: </p>
	<p> (3) Reduce frictional pressure losses (for example by increasing pipe diameter) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: </p>
	<p> (4) Improvement of drives (high efficiency motors) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: </p>
	<p> (5) Improvement of drives (speed control) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: </p>
	<p> (6) Use of sophisticated control systems <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: </p>
	<p> (7) Recover waste heat for use in other functions <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: </p>

Applicant Self-Checklist

Review Items	Description
	<p>(8) Use external cool air as intake <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p> <p>(9) Storage of compressed air near highly-fluctuating uses <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p> <p>(10) Optimise certain end use devices <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p> <p>(11) Reduce air leaks <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p> <p>(12) More frequent filter replacement <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p> <p>(13) Optimise working pressure <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p>
	<p>8. The item is whether the pumping systems would be installed: <input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 11 below. <input type="checkbox"/> No. Description: (Reasons for no installing system, no need to answer BAT Items 1 to 11 below.)</p>
Pumping	(1) Avoid oversizing when selecting pumps and replace

Applicant Self-Checklist

Review Items	Description	
	systems	<p>oversized pumps</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> <hr/> <p>(2) Match the correct choice of pump to the correct motor for the duty</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> <hr/> <p>(3) Design of pipework 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> <hr/> <p>(4) Control and regulation 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> <hr/> <p>(5) Shut down unnecessary pumps</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> <hr/> <p>(6) Use of variable speed drives (VSDs)</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> <hr/> <p>(7) Use of multiple pumps (staged cut in)</p> <p><input type="checkbox"/> Applicable</p> <p><input type="checkbox"/> Partially applicable</p> <p><input type="checkbox"/> Not applicable</p>

Applicant Self-Checklist	
Review Items	Description
	<p>Described as follows:</p>
	<p>(8) Regular maintenance. Where unplanned maintenance becomes excessive, check for: cavitation, wear, wrong type of pump</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>(9) Minimise the number of valves and bends commensurate with keeping ease of operation and maintenance</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>(10) Avoiding using too many bends (especially tight bends)</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>(11) Ensuring the pipework diameter is not too small (correct pipework diameter)</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>9. The item is whether the heating, ventilation and air conditioning (HVAC) systems would be installed:</p> <p><input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 11 below.</p> <p><input type="checkbox"/> No. Description: (Reasons for no installing system, no need to answer BAT Items 1 to 11 below.)</p>
	<p>Heating, ventilation and air conditioning (HVAC) systems</p> <p>(1) Overall system design. Identify and equip areas separately for:</p> <ul style="list-style-type: none"> • general ventilation • specific ventilation • process ventilation <p><input type="checkbox"/> Applicable</p>

Applicant Self-Checklist	
Review Items	Description
	<input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(2) Optimise the number, shape and size of intakes <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(3) Use fans: <ul style="list-style-type: none"> • of high efficiency • designed to operate at optimal rate <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(4) Manage airflow, including considering dual flow ventilation <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(5) Air system design: <ul style="list-style-type: none"> • ducts are of a sufficient size • circular ducts • avoid long runs and obstacles such as bends, narrow sections <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(6) Optimise electric motors, and consider installing a VSD <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:

Applicant Self-Checklist

Review Items	Description
	<p>(7) Use automatic control systems. Integrate with centralised technical management systems</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>(8) Integration of air filters into air duct system and heat recovery from exhaust air (heat exchangers)</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>(9) Reduce heating/cooling needs by:</p> <ul style="list-style-type: none"> • building insulation • efficient glazing • air infiltration reduction • automatic closure of doors • destratification • lowering of temperature set point during non-production period (programmable regulation) • reduction of the set point for heating and raising it for cooling <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>(10) Improve the efficiency of heating systems through:</p> <ul style="list-style-type: none"> • recovery or use of wasted heat • heat pumps • radiative and local heating systems coupled with reduced temperature set points in the non occupied areas of the buildings <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>(11) Improve the efficiency of cooling systems through the</p>

Applicant Self-Checklist	
Review Items	Description
	<p>use of free cooling</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>10. The item is whether the lighting systems 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 no installing system, no need to answer BAT Items 1 to 5 below.)</p>
Lighting systems	<p>(1) Identify illumination requirements in terms of both intensity and spectral content required for the intended task</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) Plan space and activities in order to optimise the use of natural light</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) Selection of fixtures and lamps according to specific requirements for the intended use</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) Use of lighting management control systems including occupancy sensors, timers, etc.</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) Train building occupants to utilise lighting equipment in the most efficient manner</p>

Applicant Self-Checklist	
Review Items	Description
	<input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	11. The item is whether the drying, separation, and concentration processes would be installed: <input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 11 below. <input type="checkbox"/> No. Description: (Reasons for no installing system, no need to answer BAT Items 1 to 11 below.)
Drying, separation, and concentration processes	(1) Select the optimum separation technology or combination of techniques (below) to meet the specific process equipments <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(2) Use of surplus heat from other processes <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(3) Use a combination of techniques <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(4) Mechanical processes, e.g. filtration, membrane filtration <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(5) Thermal processes <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:

Applicant Self-Checklist	
Review Items	Description
	<p>(6) Direct 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>(7) Superheated steam</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>(8) Heat recovery (including MVR and heat pumps)</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>(9) Optimise insulation of the drying 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>(10) Radiation processes</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>(11) Process automation in thermal drying processes</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)

(15) Public facilities include: combustion systems; pumping systems; steam systems; heating, ventilation and air conditioning (HVAC) systems; heat recovery systems; lighting systems; electrical power supply systems; drying, separation, and concentration processes; electric motor driven sub-systems; compressed air 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.

4. 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)

5. Appendix: Required Related Information and Documents

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

III. Energy Users as Petroleum Refineries

1. Format

- (1) 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.
- (2) 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.
- (3) 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.

2. Basic Information

Date: / /

(1) Basic Information of Applicant							
Plan Name							
Applicant ⁽¹⁾							
Responsible Person							
Address							
Contact							
Phone No.				Fax			
E-Mail							
Industrial Classification ⁽²⁾							
(2) Basic Information of Project							
A. 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⁾						
Projected Year/Month		Commercialization		From	To		
				Year	Month		
B. Energy Consumption Category and Volume	(A) Energy consumption facilities	Category		<input type="checkbox"/> Coal (Ton/Year)	<input type="checkbox"/> Natural Gas (1,000 m ³ /Year)	<input type="checkbox"/> Plant Power Consumption (kW) ⁽⁶⁾	
		Volume ⁽⁷⁾	Completed				
			Permit Application				
		Category		<input type="checkbox"/> Petroleum Products ⁽⁸⁾ (kL/Year)			
				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

		Volume	Completed Permit Application				
		(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⁾ : _____ (MWth) Installed capacity: _____ (MWe) 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 Standard Industrial Classification.

(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 Fongshan River and Heping River; Central refers to the region south of Fongshan River and norther of Jhuoshuei River, and Hualien County; Southern refers to the region south of Jhuoshuei 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 followed:

$$\eta_{net} = \frac{P_{el,net}}{m_{fuel}H_u} = \frac{P_{el,gross} - P_{aux}}{m_{fuel}H_u}$$

$P_{el,gross}$: Optimized maximum power output under design conditions (kWh) x 860 (kcal/kWh)

$P_{el,net}$: Net optimized maximum power output under design conditions (kWh) x 860 (kcal/kWh)

P_{aux} : Designed value for station service load (kWh) x 860 (kcal/kWh)

m_{fuel} : Total fuel input under design conditions

H_u : Fuel calorific value (kcal), LHV

(12) Fuel Utilization Equation is as followed:

$$\epsilon_{net} = \frac{P_{el,net} + Q_{net}}{m_{fuel}H_u}$$

$P_{el,net}$: Net optimized maximum power output under design conditions (kWh) x 860 (kcal/kWh)

Q_{net} : Net optimized thermal output under design conditions (kcal)

m_{fuel} : Total fuel input under design conditions

H_u : Fuel calorific value (kcal), LHV

C. 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.

D. 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.

3. Information Checklist

Applicant Self-Checklist	
Review Items	Description
Processing Techniques ⁽¹⁵⁾	1. <input type="checkbox"/> In accordance with version of EU BREFs Industry Industry: _____ Version: _____ <input type="checkbox"/> Yes <input type="checkbox"/> No BATs Shall be Applied in Processing Techniques for Petroleum Refineries in Appendix 3 of Regulations Governing the Assessment of Energy Development and Utilization <input type="checkbox"/> Not EU BREFs Industry
	2. (The BAT of Processing Techniques) <input type="checkbox"/> In accordance with version of EU BREFs Industry <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable <input type="checkbox"/> Not EU BREFs Industry Described as follows:
	3. (For other BAT of Processing Techniques, please attach additional spaces to the chart)
Utility Systems and Equipment ⁽¹⁶⁾	1. In accordance with version of EU ENE: <u>BREF (2009)</u> <input type="checkbox"/> Yes <input type="checkbox"/> No BATs Shall be Applied in Utility Systems and Equipment in Appendix 1 of Regulations Governing the Assessment of Energy Development and Utilization
	2. The item is whether the combustion system would be installed: <input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 23 below. <input type="checkbox"/> No. Description: (Reasons for no installing system, no need to answer BAT Items 1 to 23 below.)
	Combustion system (1) Lignite pre-drying <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(2) Coal gasification <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(3) Fuel drying

Applicant Self-Checklist	
Review Items	Description
	<input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(4) Biomass gasification <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(5) Bark pressing <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(6) Expansion turbine to recover the energy content of pressurized gases <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(7) Advanced computerised control of combustion conditions for emission reduction and boiler performance <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(8) Use of the heat content of the flue-gas for district heating <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(9) Low excess air <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable

Applicant Self-Checklist

Review Items	Description
	<p align="center">Described as follows:</p> <hr/> <p>(10) Lowering of exhaust gas temperatures <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p> <hr/> <p>(11) Low CO concentration in the flue-gas <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p> <hr/> <p>(12) Heat accumulation <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p> <hr/> <p>(13) Cooling tower discharge <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p> <hr/> <p>(14) Different techniques for the cooling system <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p> <hr/> <p>(15) Preheating of fuel gas by using waste heat <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p> <hr/> <p>(16) Preheating of combustion air <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable</p>

Applicant Self-Checklist

Review Items	Description
	<input type="checkbox"/> Not applicable Described as follows:
	(17) Recuperative and regenerative burners <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(18) Burner regulation and control <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(19) Fuel choice <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(20) Oxy-firing (oxyfuel) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(21) Reducing heat losses by insulation <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(22) Reducing losses through furnace doors <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(23) Fluidised bed combustion <input type="checkbox"/> Applicable

Applicant Self-Checklist	
Review Items	Description
	<input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	3. The item is whether the steam system would be installed: <input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 28 below. <input type="checkbox"/> No. Description: (Reasons for no installing system, no need to answer BAT Items 1 to 28 below.)
Steam systems	(1) Energy efficient design and installation of steam distribution pipework <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(2) Throttling devices and the use of backpressure turbines: utilize backpressure turbines instead of PRVs <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(3) Improve operating procedures and boiler controls <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(4) Use sequential boiler controls (apply only to sites with more than one boiler) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(5) Install flue-gas isolation dampers (applicable only to sites with more than one boiler) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:

Applicant Self-Checklist

Review Items	Description
	<p>(6) Preheat feed-water by using:</p> <ul style="list-style-type: none"> • waste heat • economisers using combustion air • deaerated feed-water to heat condensate • condensing the steam used for stripping and heating the feed water to the deaerator via a heat exchanger <p><input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable</p> <p>Described as follows:</p> <hr/> <p>(7) Prevention and removal of scale deposits on heat transfer surfaces. (Clean boiler heat transfer surfaces)</p> <p><input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable</p> <p>Described as follows:</p> <hr/> <p>(8) Minimise boiler blowdown by improving water treatment. Install automatic total dissolved solids control</p> <p><input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable</p> <p>Described as follows:</p> <hr/> <p>(9) Add/restore boiler refractory</p> <p><input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable</p> <p>Described as follows:</p> <hr/> <p>(10) Optimise deaerator vent rate</p> <p><input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable</p> <p>Described as follows:</p> <hr/> <p>(11) Minimise boiler short cycling losses</p> <p><input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable</p>

Applicant Self-Checklist

Review Items	Description
	<div data-bbox="678 273 957 353"> <input type="checkbox"/> Not applicable Described as follows: </div> <hr/> <div data-bbox="619 407 1098 609"> (12) Carrying out boiler maintenance <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: </div> <hr/> <div data-bbox="619 663 1412 909"> (13) Optimise steam distribution systems (especially to cover the issues below) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: </div> <hr/> <div data-bbox="619 963 1088 1164"> (14) Isolate steam from unused lines <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: </div> <hr/> <div data-bbox="619 1218 1385 1509"> (15) Insulation on steam pipes and condensate return pipes. (Ensure that steam system piping, valves, fittings and vessels are well insulated) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: </div> <hr/> <div data-bbox="619 1563 1369 1809"> (16) Implement a control and repair programme for steam traps <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: </div> <hr/> <div data-bbox="619 1863 1369 2016"> (17) Collect and return condensate to the boiler for re-use. (Optimise condensate recovery) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable </div>

Applicant Self-Checklist

Review Items	Description
	<p align="center"> <input type="checkbox"/> Not applicable Described as follows: </p>
	<p>(18) Re-use of flash-steam. (Use high pressure condensate to make low pressure steam)</p> <p align="center"> <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: </p>
	<p>(19) Re-use of flash-steam. (Use high pressure condensate to make low pressure steam)</p> <p align="center"> <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: </p>
	<p>(20) Expansion turbine to recover the energy content of pressurised gases</p> <p align="center"> <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: </p>
	<p>(21) Change turbine blades</p> <p align="center"> <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: </p>
	<p>(22) Use advanced materials to reach high steam parameters</p> <p align="center"> <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: </p>
	<p>(23) Supercritical steam parameters</p> <p align="center"> <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: </p>

Applicant Self-Checklist	
Review Items	Description
	<p>(24) Double reheat</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>(25) Regenerative feed-water</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>(26) Use of heat content of the flue-gas for district heating</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>(27) Heat accumulation</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>(28) Advanced computerised control of the gas turbine and subsequent recovery boilers</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. The item is whether the heat recovery system would be installed:</p> <p><input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 2 below.</p> <p><input type="checkbox"/> No. Description: (Reasons for no installing system, no need to answer BAT Items 1 to 2 below.)</p>
Heat recovery systems	<p>(1) Monitoring the efficiency periodically</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	
Review Items	Description
	<p>(2) Preventing or removing fouling</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. The item is whether the electrical power supply system would be installed:</p> <p><input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 8 below.</p> <p><input type="checkbox"/> No. Description: (Reasons for no installing system, no need to answer BAT Items 1 to 8 below.)</p>
Electrical power supply system	<p>(1) Installing capacitors in the AC circuits to decrease the magnitude of reactive power</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) Minimising the operation of idling or lightly loaded motors</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) Avoiding the operation of equipment above its rated voltage</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) Using energy efficient motors</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) Ensure power cables have the correct dimensions for the power demand</p>

Applicant Self-Checklist		
Review Items	Description	
	<input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:	
	(6) Keep online transformer(s) operating at a load above 40 ~50 % of the rated power <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:	
	(7) Use high efficiency/low loss transformers <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:	
	(8) Place equipment with a high current demand as close as possible to the power source (e.g. transformer) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:	
	6. The item is whether the electric motor driven sub-systems would be installed: <input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 7 below. <input type="checkbox"/> No. Description: (Reasons for no installing system, no need to answer BAT Items 1 to 7 below.)	
	electric motor driven sub-systems	(1) Using energy efficient motors (EEM) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
		(2) Proper motor sizing <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:

Applicant Self-Checklist

Review Items	Description	
		<p>(3) Installing high efficiency transmission/ educers <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p> <p>(4) Use: direct coupling where possible, synchronous belts or cogged V-belts in place of V belts, helical gears in place of worm gears <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p> <p>(5) Rewinding: avoid rewinding and replace with an EEM, or use a certified rewinding contractor (EEMR) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p> <p>(6) Power quality control <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p> <p>(7) Lubrication, adjustments, tuning <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p>
	<p>7. The item is whether the compressed air systems would be installed: <input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 13 below. <input type="checkbox"/> No. Description: (Reasons for no installing system, no need to answer BAT Items 1 to 13 below.)</p>	
	Compressed air systems	<p>(1) Overall system design, including multi-pressure systems <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable</p>

Applicant Self-Checklist

Review Items	Description
	<input type="checkbox"/> Not applicable Described as follows:
	(2) Improve cooling, drying and filtering <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(3) Reduce frictional pressure losses (for example by increasing pipe diameter) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(4) Improvement of drives (high efficiency motors) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(5) Improvement of drives (speed control) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(6) Use of sophisticated control systems <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(7) Recover waste heat for use in other functions <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(8) Use external cool air as intake

Applicant Self-Checklist		
Review Items	Description	
		<input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
		(9) Storage of compressed air near highly-fluctuating uses <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
		(10) Optimise certain end use devices <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
		(11) Reduce air leaks <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
		(12) More frequent filter replacement <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
		(13) Optimise working pressure <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
		8. The item is whether the pumping systems would be installed: <input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 11 below. <input type="checkbox"/> No. Description: (Reasons for no installing system, no need to answer BAT Items 1 to 11 below.)
Pumping systems		(1) Avoid oversizing when selecting pumps and replace oversized pumps

Applicant Self-Checklist	
Review Items	Description
	<input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(2) Match the correct choice of pump to the correct motor for the duty <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(3) Design of pipework system <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(4) Control and regulation system <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(5) Shut down unnecessary pumps <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(6) Use of variable speed drives (VSDs) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(7) Use of multiple pumps (staged cut in) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:

Applicant Self-Checklist	
Review Items	Description
	<p>(8) Regular maintenance. Where unplanned maintenance becomes excessive, check for: cavitation, wear, wrong type of pump</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>(9) Minimise the number of valves and bends commensurate with keeping ease of operation and maintenance</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>(10) Avoiding using too many bends (especially tight bends)</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>(11) Ensuring the pipework diameter is not too small (correct pipework diameter)</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>9. The item is whether the heating, ventilation and air conditioning (HVAC) systems would be installed:</p> <p><input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 11 below.</p> <p><input type="checkbox"/> No. Description: (Reasons for no installing system, no need to answer BAT Items 1 to 11 below.)</p>
Heating, ventilation and air conditioning (HVAC) systems	<p>(1) Overall system design. Identify and equip areas separately for:</p> <ul style="list-style-type: none"> • general ventilation • specific ventilation • process ventilation <p><input type="checkbox"/> Applicable</p> <p><input type="checkbox"/> Partially applicable</p>

Applicant Self-Checklist	
Review Items	Description
	<input type="checkbox"/> Not applicable Described as follows:
	(2) Optimise the number, shape and size of intakes <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(3) Use fans: <ul style="list-style-type: none"> • of high efficiency • designed to operate at optimal rate <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(4) Manage airflow, including considering dual flow ventilation <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(5) Air system design: <ul style="list-style-type: none"> • ducts are of a sufficient size • circular ducts • avoid long runs and obstacles such as bends, narrow sections <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(6) Optimise electric motors, and consider installing a VSD <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(7) Use automatic control systems. Integrate with centralised

Applicant Self-Checklist

Review Items	Description
	<p>technical management systems</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> <hr/> <p>(8) Integration of air filters into air duct system and heat recovery from exhaust air (heat exchangers)</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> <hr/> <p>(9) Reduce heating/cooling needs by:</p> <ul style="list-style-type: none"> • building insulation • efficient glazing • air infiltration reduction • automatic closure of doors • destratification • lowering of temperature set point during non-production period (programmable regulation) • reduction of the set point for heating and raising it for cooling <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> <hr/> <p>(10) Improve the efficiency of heating systems through:</p> <ul style="list-style-type: none"> • recovery or use of wasted heat • heat pumps • radiative and local heating systems coupled with reduced temperature set points in the non occupied areas of the buildings <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> <hr/> <p>(11) Improve the efficiency of cooling systems through the use of free cooling</p>

Applicant Self-Checklist	
Review Items	Description
	<input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	10. The item is whether the lighting systems would be installed: <input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 5 below. <input type="checkbox"/> No. Description: (Reasons for no installing system, no need to answer BAT Items 1 to 5 below.)
Lighting systems	(1) Identify illumination requirements in terms of both intensity and spectral content required for the intended task <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(2) Plan space and activities in order to optimise the use of natural light <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(3) Selection of fixtures and lamps according to specific requirements for the intended use <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(4) Use of lighting management control systems including occupancy sensors, timers, etc. <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(5) Train building occupants to utilise lighting equipment in the most efficient manner <input type="checkbox"/> Applicable

Applicant Self-Checklist

Review Items	Description	
		<input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	11. The item is whether the drying, separation, and concentration processes would be installed: <input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 11 below. <input type="checkbox"/> No. Description: (Reasons for no installing system, no need to answer BAT Items 1 to 11 below.)	
	Drying, separation, and concentration processes	(1) Select the optimum separation technology or combination of techniques (below) to meet the specific process equipments <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
(2) Use of surplus heat from other processes <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:		
(3) Use a combination of techniques <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:		
(4) Mechanical processes, e.g. filtration, membrane filtration <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:		
(5) Thermal processes <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:		

Applicant Self-Checklist	
Review Items	Description
	<p>(6) Direct 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>(7) Superheated steam</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>(8) Heat recovery (including MVR and heat pumps)</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>(9) Optimise insulation of the drying 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>(10) Radiation processes</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>(11) Process automation in thermal drying processes</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>
Cogeneration System	<p>The item is whether the cogeneration system would be installed:</p> <p><input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 4 below.</p> <p><input type="checkbox"/> No. Description: (Reasons for no installing system, no need to answer BAT Items 1 to 4 below.)</p>

Applicant Self-Checklist	
Review Items	Description
	<p>1. <input type="checkbox"/> In accordance with version of EU BREFs Contents on Cogeneration Industry: _____ Version: _____ <input type="checkbox"/> Yes <input type="checkbox"/> No BATs Shall be Applied in Processing Techniques for Petroleum Refineries in Appendix 3 of Regulations Governing the Assessment of Energy Development and Utilization</p> <p><input type="checkbox"/> In accordance with version of EU ENE Contents on Cogeneration Version: _____ <input type="checkbox"/> Yes <input type="checkbox"/> No BATs Shall be Applied in Utility Systems and Equipment in Appendix 1 of Regulations Governing the Assessment of Energy Development and Utilization</p>
	<p>2. Electrical efficiency ⁽¹⁷⁾: _____ (% , LHV); Fuel utilization ⁽¹⁸⁾: _____ (% , LHV)</p> <p>(1) <input type="checkbox"/> Combustion unit of coal and/or lignite: Rated thermal input _____ (MWth) Installed capacity _____ (MW)</p> <p>(2) <input type="checkbox"/> Combustion unit of natural gas: Rated thermal input _____ (MWth) Installed capacity _____ (MW)</p> <p>(3) <input type="checkbox"/> Combustion unit of liquid fuels: Rated thermal input _____ (MWth) Installed capacity _____ (MW) Described as follows ⁽¹⁹⁾:</p>
	<p>3. (The BAT of Cogeneration System)</p> <p><input type="checkbox"/> Comply with EU BREFs Regulations on Cogeneration <input type="checkbox"/> Comply with EU ENE Items on Cogeneration Described as follows:</p>
	<p>4. (For other BAT of Cogeneration System, 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.

(16) Public facilities include: combustion systems; pumping systems; steam systems; heating, ventilation and air conditioning (HVAC) systems; heat recovery systems; lighting systems; electrical power supply systems; drying, separation, and concentration processes; electric

motor driven sub-systems; compressed air 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.

(17) Electrical Efficiency Equation is as followed:

$$\eta_{net} = \frac{P_{el,net}}{m_{fuel}H_u} = \frac{P_{el,gross} - P_{aux}}{m_{fuel}H_u}$$

$P_{el,gross}$: Optimized maximum power output under design conditions (kWh) x 860 (kcal/kWh)

$P_{el,net}$: Net optimized maximum power output under design conditions (kWh) x 860 (kcal/kWh)

P_{aux} : Designed value for station service load (kWh) x 860 (kcal/kWh)

m_{fuel} : Total fuel input under design conditions

H_u : Fuel calorific value (kcal), LHV

(18) Fuel Utilization Equation is as followed:

$$\epsilon_{net} = \frac{P_{el,net} + Q_{net}}{m_{fuel}H_u}$$

$P_{el,net}$: Net optimized maximum power output under design conditions (kWh) x 860 (kcal/kWh)

Q_{net} : Net optimized thermal output under design conditions (kcal)

m_{fuel} : Total fuel input under design conditions

H_u : Fuel calorific value (kcal), LHV

(19) The item should interpret the type of unit and fuel utilization equation of cogeneration system.

4. 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)

5. Appendix: Required Related Information and Documents

- (1) 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.
- (2) Other Related Information and Documents: Those adopting new processing techniques must provide qualitative or quantitative descriptions of efficiency greater than existing standards.

IV. Energy Users as massive energy-consumption users

1. Format

- (1) 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.
- (2) 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.
- (3) 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.

2. Basic Information

Date: / /

(1) Basic Information of Applicant							
Plan Name							
Applicant ⁽¹⁾							
Responsible Person							
Address							
Contact							
Phone No.		Fax					
E-Mail							
Industrial Classification ⁽²⁾							
(2) Basic Information of Project							
A. 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 Year/Month	Commercialization	Year	Month			
B. Energy Consumption Category and Volume	(A) Energy consumption facilities	Category		<input type="checkbox"/> Coal (Ton/Year)	<input type="checkbox"/> Natural Gas (1000 m ³ /Year)	<input type="checkbox"/> Plant Power Consumption (kW) ⁽⁶⁾	
		Volume ⁽⁷⁾	Completed				
			Permit Application				
		Category		<input type="checkbox"/> Petroleum Products ⁽⁸⁾ (kL/Year)			

		Volume	Completed Permit Application				
		(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⁾ : _____ (MWth) Installed capacity: _____ (MWe) 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 Standard Industrial Classification.

(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 Fongshan River and Heping River; Central refers to the region south of Fongshan River and norther of Jhuoshuei River, and Hualien County; Southern refers to the region south of Jhuoshuei 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 followed:

$$\eta_{net} = \frac{P_{el,net}}{m_{fuel}H_u} = \frac{P_{el,gross} - P_{aux}}{m_{fuel}H_u}$$

$P_{el,gross}$: Optimized maximum power output under design conditions (kWh) x 860 (kcal/kWh)

$P_{el,net}$: Net optimized maximum power output under design conditions (kWh) x 860 (kcal/kWh)

P_{aux} : Designed value for station service load (kWh) x 860 (kcal/kWh)

m_{fuel} : Total fuel input under design conditions

H_u : Fuel calorific value (kcal), LHV

(12) Fuel Utilization Equation is as followed:

$$\epsilon_{net} = \frac{P_{el,net} + Q_{net}}{m_{fuel}H_u}$$

$P_{el,net}$: Net optimized maximum power output under design conditions (kWh) x 860 (kcal/kWh)

Q_{net} : Net optimized thermal output under design conditions (kcal)

m_{fuel} : Total fuel input under design conditions

H_u : Fuel calorific value (kcal), LHV

C. 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.

D. 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.

3. Information Checklist

Applicant Self-Checklist					
Review Items	Description				
Processing Techniques ⁽¹⁵⁾	<p>1. <input type="checkbox"/> In accordance with version of EU BREFs Industry Industry: _____ Version: _____ <input type="checkbox"/> Yes <input type="checkbox"/> No BATs Shall be Applied in Processing Techniques for Petroleum Refineries in Appendix 3 of Regulations Governing the Assessment of Energy Development and Utilization <input type="checkbox"/> Not EU BREFs Industry</p>				
	<p>2. (The BAT of Processing Techniques) <input type="checkbox"/> In accordance with version of EU BREFs Industry <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable <input type="checkbox"/> Not EU BREFs Industry Described as follows:</p>				
	<p>3. (For other BAT of Processing Techniques, please attach additional spaces to the chart)</p>				
Utility Systems and Equipment ⁽¹⁶⁾	<p>1. In accordance with version of EU ENE: <u>BREF (2009)</u> <input type="checkbox"/> Yes <input type="checkbox"/> No BATs Shall be Applied in Utility Systems and Equipment in Appendix 1 of Regulations Governing the Assessment of Energy Development and Utilization</p>				
	<p>2. The item is whether the combustion system would be installed: <input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 23 below. <input type="checkbox"/> No. Description: (Reasons for no installing system, no need to answer BAT Items 1 to 23 below.)</p>				
	<table border="1"> <tr> <td rowspan="3">Combustion system</td> <td> <p>(1) Lignite pre-drying <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p> </td> </tr> <tr> <td> <p>(2) Coal gasification <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p> </td> </tr> <tr> <td> <p>(3) Fuel drying</p> </td> </tr> </table>	Combustion system	<p>(1) Lignite pre-drying <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p>	<p>(2) Coal gasification <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p>	<p>(3) Fuel drying</p>
	Combustion system		<p>(1) Lignite pre-drying <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p>		
<p>(2) Coal gasification <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p>					
<p>(3) Fuel drying</p>					
<p>(3) Fuel drying</p>					

Applicant Self-Checklist	
Review Items	Description
	<input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(4) Biomass gasification <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(5) Bark pressing <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(6) Expansion turbine to recover the energy content of pressurized gases <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(7) Advanced computerised control of combustion conditions for emission reduction and boiler performance <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(8) Use of the heat content of the flue-gas for district heating <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(9) Low excess air <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable

Applicant Self-Checklist

Review Items	Description
	<p align="center">Described as follows:</p> <hr/> <p>(10) Lowering of exhaust gas temperatures <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p> <hr/> <p>(11) Low CO concentration in the flue-gas <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p> <hr/> <p>(12) Heat accumulation <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p> <hr/> <p>(13) Cooling tower discharge <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p> <hr/> <p>(14) Different techniques for the cooling system <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p> <hr/> <p>(15) Preheating of fuel gas by using waste heat <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p> <hr/> <p>(16) Preheating of combustion air <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable</p>

Applicant Self-Checklist

Review Items	Description
	<input type="checkbox"/> Not applicable Described as follows:
	(17) Recuperative and regenerative burners <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(18) Burner regulation and control <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(19) Fuel choice <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(20) Oxy-firing (oxyfuel) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(21) Reducing heat losses by insulation <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(22) Reducing losses through furnace doors <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(23) Fluidised bed combustion <input type="checkbox"/> Applicable

Applicant Self-Checklist	
Review Items	Description
	<input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	3. The item is whether the steam system would be installed: <input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 28 below. <input type="checkbox"/> No. Description: (Reasons for no installing system, no need to answer BAT Items 1 to 28 below.)
Steam systems	(1) Energy efficient design and installation of steam distribution pipework <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(2) Throttling devices and the use of backpressure turbines: utilize backpressure turbines instead of PRVs <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(3) Improve operating procedures and boiler controls <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(4) Use sequential boiler controls (apply only to sites with more than one boiler) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(5) Install flue-gas isolation dampers (applicable only to sites with more than one boiler) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:

Applicant Self-Checklist

Review Items	Description
	<p>(6) Preheat feed-water by using:</p> <ul style="list-style-type: none"> • waste heat • economisers using combustion air • deaerated feed-water to heat condensate • condensing the steam used for stripping and heating the feed water to the deaerator via a heat exchanger <p><input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>
	<p>(7) Prevention and removal of scale deposits on heat transfer surfaces. (Clean boiler heat transfer surfaces)</p> <p><input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>
	<p>(8) Minimise boiler blowdown by improving water treatment. Install automatic total dissolved solids control</p> <p><input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>
	<p>(9) Add/restore boiler refractory</p> <p><input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>
	<p>(10) Optimise deaerator vent rate</p> <p><input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable</p> <p>Described as follows:</p>
	<p>(11) Minimise boiler short cycling losses</p> <p><input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable</p>

Applicant Self-Checklist

Review Items	Description
	<div data-bbox="678 273 957 353"> <input type="checkbox"/> Not applicable Described as follows: </div> <hr/> <div data-bbox="619 407 1098 609"> (12) Carrying out boiler maintenance <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: </div> <hr/> <div data-bbox="619 663 1412 909"> (13) Optimise steam distribution systems (especially to cover the issues below) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: </div> <hr/> <div data-bbox="619 963 1088 1164"> (14) Isolate steam from unused lines <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: </div> <hr/> <div data-bbox="619 1218 1385 1509"> (15) Insulation on steam pipes and condensate return pipes. (Ensure that steam system piping, valves, fittings and vessels are well insulated) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: </div> <hr/> <div data-bbox="619 1563 1369 1809"> (16) Implement a control and repair programme for steam traps <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows: </div> <hr/> <div data-bbox="619 1863 1369 2016"> (17) Collect and return condensate to the boiler for re-use. (Optimise condensate recovery) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable </div>

Applicant Self-Checklist

Review Items	Description
	<input type="checkbox"/> Not applicable Described as follows:
	(18) Re-use of flash-steam. (Use high pressure condensate to make low pressure steam) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(19) Re-use of flash-steam. (Use high pressure condensate to make low pressure steam) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(20) Expansion turbine to recover the energy content of pressurised gases <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(21) Change turbine blades <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(22) Use advanced materials to reach high steam parameters <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(23) Supercritical steam parameters <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:

Applicant Self-Checklist	
Review Items	Description
	<p>(24) Double reheat</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>(25) Regenerative feed-water</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>(26) Use of heat content of the flue-gas for district heating</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>(27) Heat accumulation</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>(28) Advanced computerised control of the gas turbine and subsequent recovery boilers</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. The item is whether the heat recovery system would be installed:</p> <p><input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 2 below.</p> <p><input type="checkbox"/> No. Description: (Reasons for no installing system, no need to answer BAT Items 1 to 2 below.)</p>
Heat recovery systems	<p>(1) Monitoring the efficiency periodically</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	
Review Items	Description
	<p>(2) Preventing or removing fouling</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. The item is whether the electrical power supply system would be installed:</p> <p><input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 8 below.</p> <p><input type="checkbox"/> No. Description: (Reasons for no installing system, no need to answer BAT Items 1 to 8 below.)</p>
Electrical power supply system	<p>(1) Installing capacitors in the AC circuits to decrease the magnitude of reactive power</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) Minimising the operation of idling or lightly loaded motors</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) Avoiding the operation of equipment above its rated voltage</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) Using energy efficient motors</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) Ensure power cables have the correct dimensions for the power demand</p>

Applicant Self-Checklist		
Review Items	Description	
	<input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:	
	(6) Keep online transformer(s) operating at a load above 40 ~50 % of the rated power <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:	
	(7) Use high efficiency/low loss transformers <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:	
	(8) Place equipment with a high current demand as close as possible to the power source (e.g. transformer) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:	
	6. The item is whether the electric motor driven sub-systems would be installed: <input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 7 below. <input type="checkbox"/> No. Description: (Reasons for no installing system, no need to answer BAT Items 1 to 7 below.)	
	electric motor driven sub-systems	(1) Using energy efficient motors (EEM) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
		(2) Proper motor sizing <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:

Applicant Self-Checklist

Review Items	Description
	<p>(3) Installing high efficiency transmission/ educers <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p> <p>(4) Use: direct coupling where possible, synchronous belts or cogged V-belts in place of V belts, helical gears in place of worm gears <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p> <p>(5) Rewinding: avoid rewinding and replace with an EEM, or use a certified rewinding contractor (EEMR) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p> <p>(6) Power quality control <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p> <p>(7) Lubrication, adjustments, tuning <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:</p>
	<p>7. The item is whether the compressed air systems would be installed: <input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 13 below. <input type="checkbox"/> No. Description: (Reasons for no installing system, no need to answer BAT Items 1 to 13 below.)</p>
Compressed air systems	<p>(1) Overall system design, including multi-pressure systems <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable</p>

Applicant Self-Checklist

Review Items	Description
	<input type="checkbox"/> Not applicable Described as follows:
	(2) Improve cooling, drying and filtering <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(3) Reduce frictional pressure losses (for example by increasing pipe diameter) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(4) Improvement of drives (high efficiency motors) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(5) Improvement of drives (speed control) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(6) Use of sophisticated control systems <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(7) Recover waste heat for use in other functions <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(8) Use external cool air as intake

Applicant Self-Checklist		
Review Items	Description	
		<input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
		(9) Storage of compressed air near highly-fluctuating uses <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
		(10) Optimise certain end use devices <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
		(11) Reduce air leaks <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
		(12) More frequent filter replacement <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
		(13) Optimise working pressure <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
		8. The item is whether the pumping systems would be installed: <input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 11 below. <input type="checkbox"/> No. Description: (Reasons for no installing system, no need to answer BAT Items 1 to 11 below.)
Pumping systems		(1) Avoid oversizing when selecting pumps and replace oversized pumps

Applicant Self-Checklist	
Review Items	Description
	<input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(2) Match the correct choice of pump to the correct motor for the duty <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(3) Design of pipework system <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(4) Control and regulation system <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(5) Shut down unnecessary pumps <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(6) Use of variable speed drives (VSDs) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(7) Use of multiple pumps (staged cut in) <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:

Applicant Self-Checklist	
Review Items	Description
	<p>(8) Regular maintenance. Where unplanned maintenance becomes excessive, check for: cavitation, wear, wrong type of pump</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>(9) Minimise the number of valves and bends commensurate with keeping ease of operation and maintenance</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>(10) Avoiding using too many bends (especially tight bends)</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>(11) Ensuring the pipework diameter is not too small (correct pipework diameter)</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>9. The item is whether the heating, ventilation and air conditioning (HVAC) systems would be installed:</p> <p><input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 11 below.</p> <p><input type="checkbox"/> No. Description: (Reasons for no installing system, no need to answer BAT Items 1 to 11 below.)</p>
Heating, ventilation and air conditioning (HVAC) systems	<p>(1) Overall system design. Identify and equip areas separately for:</p> <ul style="list-style-type: none"> • general ventilation • specific ventilation • process ventilation <p><input type="checkbox"/> Applicable</p> <p><input type="checkbox"/> Partially applicable</p>

Applicant Self-Checklist	
Review Items	Description
	<input type="checkbox"/> Not applicable Described as follows:
	(2) Optimise the number, shape and size of intakes <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(3) Use fans: <ul style="list-style-type: none"> • of high efficiency • designed to operate at optimal rate <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(4) Manage airflow, including considering dual flow ventilation <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(5) Air system design: <ul style="list-style-type: none"> • ducts are of a sufficient size • circular ducts • avoid long runs and obstacles such as bends, narrow sections <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(6) Optimise electric motors, and consider installing a VSD <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(7) Use automatic control systems. Integrate with centralised

Applicant Self-Checklist

Review Items	Description
	<p>technical management systems</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> <hr/> <p>(8) Integration of air filters into air duct system and heat recovery from exhaust air (heat exchangers)</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> <hr/> <p>(9) Reduce heating/cooling needs by:</p> <ul style="list-style-type: none"> • building insulation • efficient glazing • air infiltration reduction • automatic closure of doors • destratification • lowering of temperature set point during non-production period (programmable regulation) • reduction of the set point for heating and raising it for cooling <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> <hr/> <p>(10) Improve the efficiency of heating systems through:</p> <ul style="list-style-type: none"> • recovery or use of wasted heat • heat pumps • radiative and local heating systems coupled with reduced temperature set points in the non occupied areas of the buildings <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> <hr/> <p>(11) Improve the efficiency of cooling systems through the use of free cooling</p>

Applicant Self-Checklist	
Review Items	Description
	<input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	10. The item is whether the lighting systems would be installed: <input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 5 below. <input type="checkbox"/> No. Description: (Reasons for no installing system, no need to answer BAT Items 1 to 5 below.)
Lighting systems	(1) Identify illumination requirements in terms of both intensity and spectral content required for the intended task <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(2) Plan space and activities in order to optimise the use of natural light <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(3) Selection of fixtures and lamps according to specific requirements for the intended use <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(4) Use of lighting management control systems including occupancy sensors, timers, etc. <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	(5) Train building occupants to utilise lighting equipment in the most efficient manner <input type="checkbox"/> Applicable

Applicant Self-Checklist

Review Items	Description	
		<input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
	11. The item is whether the drying, separation, and concentration processes would be installed: <input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 11 below. <input type="checkbox"/> No. Description: (Reasons for no installing system, no need to answer BAT Items 1 to 11 below.)	
	Drying, separation, and concentration processes	(1) Select the optimum separation technology or combination of techniques (below) to meet the specific process equipments <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:
(2) Use of surplus heat from other processes <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:		
(3) Use a combination of techniques <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:		
(4) Mechanical processes, e.g. filtration, membrane filtration <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:		
(5) Thermal processes <input type="checkbox"/> Applicable <input type="checkbox"/> Partially applicable <input type="checkbox"/> Not applicable Described as follows:		

Applicant Self-Checklist	
Review Items	Description
	<p>(6) Direct 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>(7) Superheated steam</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>(8) Heat recovery (including MVR and heat pumps)</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>(9) Optimise insulation of the drying 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>(10) Radiation processes</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>(11) Process automation in thermal drying processes</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>
Cogeneration System	<p>The item is whether the cogeneration system would be installed:</p> <p><input type="checkbox"/> Yes. Provide further description in BAT Items 1 to 4 below.</p> <p><input type="checkbox"/> No. Description: (Reasons for no installing system, no need to answer BAT Items 1 to 4 below.)</p>

Applicant Self-Checklist	
Review Items	Description
	<p>1. <input type="checkbox"/> In accordance with version of EU BREFs Contents on Cogeneration Industry: _____ Version: _____ <input type="checkbox"/> Yes <input type="checkbox"/> No BATs Shall be Applied in Processing Techniques for Petroleum Refineries in Appendix 3 of Regulations Governing the Assessment of Energy Development and Utilization</p> <p><input type="checkbox"/> In accordance with version of EU ENE Contents on Cogeneration Version: _____ <input type="checkbox"/> Yes <input type="checkbox"/> No BATs Shall be Applied in Utility Systems and Equipment in Appendix 1 of Regulations Governing the Assessment of Energy Development and Utilization</p>
	<p>2. Electrical efficiency ⁽¹⁷⁾: _____ (% , LHV); Fuel utilization ⁽¹⁸⁾: _____ (% , LHV)</p> <p>(1) <input type="checkbox"/> Combustion unit of coal and/or lignite: Rated thermal input _____ (MWth) Installed capacity _____ (MW)</p> <p>(2) <input type="checkbox"/> Combustion unit of natural gas: Rated thermal input _____ (MWth) Installed capacity _____ (MW)</p> <p>(3) <input type="checkbox"/> Combustion unit of liquid fuels: Rated thermal input _____ (MWth) Installed capacity _____ (MW) Described as follows ⁽¹⁹⁾:</p>
	<p>3. (The BAT of Cogeneration System)</p> <p><input type="checkbox"/> Comply with EU BREFs Regulations on Cogeneration <input type="checkbox"/> Comply with EU ENE Items on Cogeneration Described as follows:</p>
	<p>4. (For other BAT of Cogeneration System, 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. Processing techniques in compliance with Semi-Conductor and Panel Industries shall be indicated. For processing techniques of Semi-Conductor and Panel Industries that do not comply with regulations, explanations must be provided. Processing techniques in compliance with Semi-Conductor and Panel Industries shall be indicated. Processing

techniques are incompatible with EU BREFs, Semi-Conductor and Panel Industries, qualitative or quantitative descriptions of efficiency should be provided by applicant.

(16) Public facilities include: combustion systems; pumping systems; steam systems; heating, ventilation and air conditioning (HVAC) systems; heat recovery systems; lighting systems; electrical power supply systems; drying, separation, and concentration processes; electric motor driven sub-systems; compressed air 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.

(17) Electrical Efficiency Equation is as followed:

$$\eta_{net} = \frac{P_{el,net}}{m_{fuel}H_u} = \frac{P_{el,gross} - P_{aux}}{m_{fuel}H_u}$$

$P_{el,gross}$: Optimized maximum power output under design conditions (kWh) x 860 (kcal/kWh)

$P_{el,net}$: Net optimized maximum power output under design conditions (kWh) x 860 (kcal/kWh)

P_{aux} : Designed value for station service load (kWh) x 860 (kcal/kWh)

m_{fuel} : Total fuel input under design conditions

H_u : Fuel calorific value (kcal), LHV

(18) Fuel Utilization Equation is as followed:

$$\varepsilon_{net} = \frac{P_{el,net} + Q_{net}}{m_{fuel}H_u}$$

$P_{el,net}$: Net optimized maximum power output under design conditions (kWh) x 860 (kcal/kWh)

Q_{net} : Net optimized thermal output under design conditions (kcal)

m_{fuel} : Total fuel input under design conditions

H_u : Fuel calorific value (kcal), LHV

(19) The item should interpret the type of unit and fuel utilization equation of cogeneration system.

4. 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)

5. Appendix: Required Related Information and Documents

- (3) 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.
- (4) Other Related Information and Documents: Those adopting new processing techniques must provide qualitative or quantitative descriptions of efficiency greater than existing standards.