

CIRCULAR

SETTING ENERGY BENCHMARKS IN THE PULP AND PAPER INDUSTRY

Pursuant to the Government's Decree No. 98/2017/ND-CP dated August 18, 2017, defining the functions, tasks, powers and organizational structure of the Ministry of Industry and Trade;

Pursuant to the Law on Economical and Effective Use of Energy dated June 28, 2010:

Pursuant to the Government's Decree No. 21/2011/ND-CP dated March 29, 2011, elaborating on and providing measures for implementation of the Law on Economical and Effective Use of Energy;

Upon the request of the Director of Department of Energy Efficiency and Sustainable Development, Minister of Industry and Trade hereunder introduces the Circular on energy use or efficiency benchmarks in the pulp and paper industry.

Chapter I

GENERAL PROVISIONS

Article 1. Scope

This Circular prescribes energy consumption benchmarks in the pulp and paper industry to be applied till end of 2020 and for the period from 2021 to end of 2025 to the following products:

1. Packaging paper made from recycled materials.
2. Tissue paper (toilet paper/hygienic tissue paper of all kinds) made both from virgin and recycled paper pulp.
3. Printing, writing and photocopying paper produced from virgin paper pulp, non-deinked recycled paper, or made according to the integrated papermaking process from wood.

Article 2. Subject matter

This Circular shall apply to paper mills and other relevant entities and persons referred to in Article 1 herein.

Article 3. Interpretation of terms

1. *Specific energy consumption (SEC)* refers to total energy used for producing a unit of product.
2. *Energy (consumption) benchmark* refers to a progressive level of specific energy consumption (SEC) to be applied over a period of time specified in this Circular.
3. Details about several packaging paper products:
 - a) Testliner paper refers to an industrial paper product used to make the outer layer of carton box;
 - b) Medium paper is used as the corrugated or inner layer of the carton box;
 - c) Chipboard (millboard) paper refers to an industrial paper product widely used for making cardboard tubes and cores (e.g. fiber, yarn cores), tea container boxes or paper pallets, paper cardboard hangers, freight container cardboard linings, etc.;
 - d) Coreboard paper refers to a paper product commonly used in the fiber industry and other purposes such as for winding reels of paper, plastic, etc. materials. Despite serving the same purposes as Chipboard paper, Coreboard paper is the better paper product with the higher layer-to-layer adhesion, separation resistance and load-bearing capacity.

Chapter II

ENERGY CONSUMPTION BENCHMARKING AND IMPROVEMENT SOLUTIONS IN THE PULP AND PAPER INDUSTRY

Article 4. SEC calculation methods

SEC in the pulp and paper industry is calculated by using the methods specified in Appendix I hereto.

Article 5. Energy consumption benchmarking

1. Energy benchmarks apply to paper products till end of 2020

| No. | Product description | Output (tonne/year) | Benchmark (MJ/tonne) |
|-----|--|--|----------------------|
| 1 | Packaging paper | > 50,000 | 7 809 |
| | | 10,000 – 50,000 | 7,872 |
| | | < 10,000 | 6,728 |
| 2 | Tissue paper | 10,000 – 50,000 (Having higher quality than those products of which output is < 10,000) | 16,503 |
| | | < 10,000 | 14,914 |
| 3 | Printing, writing and photocopying paper | >50,000 (produced by running the composite manufacturing system) | 15,138 |
| | | 10,000 – 50,000 (produced by running the paper pulp production line, except the recycled paper processing system) | 10,495 |

2. Energy benchmarks apply to paper products in the period from 2021 to end of 2025

| No. | Product description | Output (tonne/year) | Benchmark (MJ/tonne) |
|-----|--|--|----------------------|
| 1 | Packaging paper | > 50,000 | 6,713 |
| | | 10,000 – 50,000 | 6,744 |
| | | < 10,000 | 5,482 |
| 2 | Tissue paper | 10,000 – 50,000 (Having higher quality than those products of which output is < 10,000) | 14,572 |
| | | < 10,000 | 13,169 |
| 3 | Printing, writing and photocopying paper | > 50,000 (produced by operating the composite manufacturing system) | 13,639 |
| | | 10,000 – 50,000 (produced by running the paper pulp production line, except the recycled paper processing system) | 9,455 |

Article 6. Requirements for conformance to energy benchmarks

1. Paper mills must ensure that their specific energy consumption does not exceed energy benchmarks specified in Article 5 herein.

2. Where any active paper mill has higher SEC in production of paper products than the energy benchmarks specific to output levels mentioned in Article 5 herein, it shall seek and adopt solutions for improved energy efficiency in order to ensure conformance to energy benchmarks specified in Article 5 herein.

3. In new investment projects, SEC is not allowed to be greater than the energy benchmarks specified in clause 2 of Article 5 herein.

Article 7. Several solutions to improvement of energy efficiency in the pulp and paper industry

1. During the process of seeking and adopting solutions for improvement of energy efficiency in the pulp and paper industry, managerial and technological solutions need to be fully taken into account.
2. Paper mills are advised to apply advanced energy management standards and solutions for improvement of energy efficiency in the pulp and paper industry referred to in Appendix II hereto.

Chapter III

IMPLEMENTATION

Article 8. Responsibilities of state regulatory authorities

1. Department of Energy Efficiency and Sustainable Development (Ministry of Industry and Trade of Vietnam) shall assume the following responsibilities:

- a) Take charge of and cooperate with relevant agencies in providing instructions and conducting the supervision and inspection of the implementation of regulations of this Circular.
- b) Cooperate with provincial Departments of Industry and Trade in examining conformance to energy benchmarks, feasibility of plans in order to ensure conformance to energy benchmarks as planned.
- c) Report to the Minister of Industry and Trade on violations against regulations of Article 5 herein and propose remedial measures or punitive actions according to law in force.

2. Departments of Industry and Trade of centrally-affiliated cities and provinces shall assume the following responsibilities:

- a) Cooperate with Department of Energy Efficiency and Sustainable Development in providing instructions for, facilitating and examining the economical and efficient use of energy in compliance with this Circular. Every year, take charge of inspecting conformance to energy benchmarks and feasibility of plans in order to ensure that local paper mills (with respect to those that fail to meet energy benchmarks) must conform to energy benchmarks as planned.
- b) Prepare the general review report on local paper mills' conformance to energy benchmarks in the current year for submission to the Ministry of Industry and Trade of Vietnam by January 31 in the following year according to Appendix III hereto.

Article 9. Responsibilities of paper mills, entities and persons

1. Entities and persons involved in paper production activities must plan how they can do to satisfy regulations of Article 6 herein.
2. By January 15 each year, paper mills shall submit reports on their conformance to energy benchmarks in the previous year to the provincial Departments of Industry and Trade as per regulations of Appendix IV hereto.
3. Within 06 months from the effective date of this Circular, paper mills that have not had any SEC available for use must fully install energy meters to ensure that their SEC is computed precisely.

Article 10. Effect

1. This Circular is entering into force as from January 10, 2018.
2. Entities and persons that do not obey regulations laid down herein shall be subject to punitive measures prescribed in current laws and regulations.
3. In the course of implementation hereof, if there is any issue or query that arises, agencies, entities and persons involved may send timely feedback to the Ministry of Industry and Trade of Viet Nam for its further study and approval of amendments or supplements to the Circular./.

MINISTER

Tran Tuan Anh

APPENDIX I

METHODS FOR CALCULATION OF SEC AVAILABLE FOR USE AT PAPER MILLS

(attached to the Circular No. 24/2017/TT-BCT dated November 23, 2017 of the Minister of Industry and Trade)

1. Assessment scope: Paper production sites (including production lines, ancillary sections and waste treatment sites), excluding administrative zones or sites intended for manufacturing of other products.
2. Time length for determination of SEC of the surveyed object is one year starting on January 1 and ending on December 31. In case inspection of any energy benchmark is required, the approved time length for such inspection shall be the amount of time necessary for completing a production cycle.
3. Parameters used for determining SEC rates of paper mills:

| <i>Parameter</i> | <i>Meaning (per year)</i> | <i>Unit</i> |
|------------------|--|--------------------|
| E | Electrical energy used for industrial purposes | kWh |
| T _i | Amount of fuels used for industrial purposes | tonne, litre, etc. |
| P _i | Production of paper products | tonne |

4. SEC of a paper mill is calculated according to the following formula:

$$SEC = \frac{E_e}{P(e)} + \frac{T_e}{P(t)} \quad (\text{MJ/tonne})$$

Where:

- E_e: Electrical energy used for industrial purposes (expressed in MJ)
- T_e: Thermal energy used for industrial purposes (expressed in MJ)
- P(e): Production converted according to electrical components (expressed in tonne)
- P(t): Production converted according to thermal components (expressed in tonne)

5. Calculation of E_e, T_e, P(e) and P(t) values:

a) Calculation of converted electrical energy E_e,

Electrical energy consumed at a production site during the survey duration is converted into the unit of measurement MJ as follows:

$$E_e = E \times 3,6 \quad [\text{MJ}]$$

Where:

- E_e: Electrical energy consumed at a production site during the survey duration, expressed in MJ,
- E: Electrical energy consumed at a production site during the survey duration, expressed in kWh.

b) Calculation of converted thermal energy T_e,

Thermal energy consumed at a production site during the survey duration is converted into the unit of measurement MJ as follows:

$$T_e = \sum T_i \times k_i \quad [\text{MJ}]$$

Where:

- T_e: Thermal energy consumed at a production site during the survey duration which is converted into MJ,
- T_i: Amount of energy consumed at a production site during the survey duration,
- k_i: Conversion factor specified in Table 1.

Table 1. Conversion factor k (fuel i)

| <i>Fuel</i> | <i>Classification</i> | <i>Unit of Measure</i> | <i>Conversion factor, MJ/unit</i> |
|-----------------|------------------------------------|------------------------|-----------------------------------|
| T (coal) | Slack grade 1,2 | Tonne | 29,309 |
| | Slack grade 3,4 | Tonne | 25,122 |
| | Slack grade 5,6 | Tonne | 20,935 |
| T (DO) | Diesel oil (DO) | Tonne | 42,707 |
| | | 1000 liters | 36,846 |
| T (FO) | Fuel oil (FO) | Tonne | 41,451 |
| | | 1000 liters | 39,358 |
| T (LPG) | Liquefied petroleum gas | Tonne | 45,638 |
| T (steam) | Steam (absolute pressure of 6 bar) | Tonne | 3,674 |
| | Steam (absolute pressure of 7 bar) | Tonne | 3,681 |
| | Steam (absolute pressure of 8 bar) | Tonne | 3,690 |
| | Steam (absolute pressure of 9 bar) | Tonne | 3,696 |
| T (other fuels) | Wood/rice husk/biomass | Tonne | 15,600 |
| | Other types of biomass | Tonne | 11.600 |

c) Calculation of converted production $P(e)$ or $P(t)$ of packaging paper products (during the survey duration).

$$P(e) = P_1 + P_2 + 1.31xP_3 + P_4 \quad (\text{tonne})$$

$$P(t) = P_1 + P_2 + 1.48xP_3 + P_4 \quad (\text{tonne})$$

Where:

- $P(e)$: Production converted according to electrical components (expressed in tonne)
- $P(t)$: Production converted according to thermal components (expressed in tonne)
- P_1 : Production of Testliner paper products
- P_2 : Production of Medium paper products
- P_3 : Production of sizing medium paper products
- P_4 : Production of Chipboard and Coreboard paper products or other products produced in small quantities.

d) Calculation of converted production $P(e)$ or $P(t)$ of tissue paper products (during the survey duration):

$$P(e) = P_1 + P_2 + 1.33xP_3 \quad (\text{tonne})$$

$$P(t) = P_1 + P_2 + 1.11xP_3 \quad (\text{tonne})$$

Where:

- $P(e)$: Production converted according to electrical components (expressed in tonne)
- $P(t)$: Production converted according to thermal components (expressed in tonne)
- P_1 : Production of tissue paper products made from original virgin pulp
- P_2 : Production of tissue paper products made from non-deinked recycled paper
- P_3 : Production of tissue paper products made from deinked paper

e) Calculation of converted production $P(e)$ or $P(t)$ of printing and writing paper products (during the survey duration):

$$P(e) = P \quad (\text{tonne})$$

$$P(t) = P \quad (\text{tonne})$$

Where:

- P(e): Production converted according to electrical components (expressed in tonne)
- P(t): Production converted according to thermal components (expressed in tonne)
- P: Production of printing and writing paper products

Unofficial Translation _ For reference only

APPENDIX II

SEVERAL TECHNOLOGICAL SOLUTIONS FOR ENERGY EFFICIENCY IN PULP AND PAPER INDUSTRY

(attached to the Circular No. 24/2017/TT-BCT dated November 23, 2017 of the Minister of Industry and Trade)

| No. | Energy-efficient solutions |
|-----|--|
| 1 | Humidity control of products |
| 2 | Online supervision of humidity |
| 3 | Use of inverters (for compressors, vacuum pumps, etc.) |
| 4 | Improvement of steam systems (increasing insulation, reducing leaks, ...) |
| 5 | Use of high-performance/high-efficiency vacuum pumps |
| 6 | Use of thermal compression devices |
| 7 | Full control of compressed air systems |
| 8 | Use of cogeneration systems |
| 9 | Combustion optimization in boilers |
| 10 | Heat utilization for air heaters |
| 11 | Using new high-performance/ high-efficiency technological equipment to replace old technological equipment in the production process |
| 12 | Replacing rotating siphons with static siphons in dryer rolls |
| 13 | Extended press nips |
| 14 | Steam boxes |
| 15 | Anaerobic wastewater treatment |
| 16 | Improved dryers |
| 17 | Strengthened care and maintenance |
| 18 | Putting energy management systems into operation |
| 19 | Waste heat recovery solutions |

APPENDIX III

SAMPLE REPORT ON CONFORMANCE TO ENERGY BENCHMARKS IN THE PULP AND PAPER INDUSTRY

(attached to the Circular No. 24/2017/TT-BCT dated November 23, 2017 of the Minister of Industry and Trade)

Sample report

(Intended for Departments of Industry and Trade)

People's Committee of
**DEPARTMENT OF INDUSTRY
AND TRADE**

SOCIALIST REPUBLIC OF VIETNAM
Independence - Freedom - Happiness

No. ...

....., day...month...year...

REPORT ON CONFORMANCE TO ENERGY BENCHMARKS IN THE PULP AND PAPER INDUSTRY

Year...

To Department of Energy Efficiency and Sustainable Development, affiliated to Ministry of Industry and Trade of Vietnam

In implementing the regulations of the Circular No. .../ .../TT-BCT dated (dd/mm/2017)..... of the Minister of Industry and Trade, prescribing conformance to energy benchmarks of paper mills, Department of Industry and Trade of.....is reporting on the conformance to energy benchmarks in the pulp and paper industry at the localities under its management as follows:

I. Conformance to energy efficiency benchmarks in the pulp and paper industry:

- The number of paper mills submitting reports:

- Paper mills failing to submit reports are listed in detail hereunder:

| No. | Name and address |
|-----|------------------|
| 1 | |
| 2 | |
| 3 | |
| ... | |

- Those paper mills not yet conforming to energy efficiency benchmarks are listed hereunder:

| No. | Paper mill (Describing product name, type, production amount) | SEC (MJ/tonne) | Brief of solutions to improve energy efficiency and deadlines for implementation of these solutions |
|-----|---|----------------|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| ... | | | |

Legal representative

(Signature, full name and seal)

Recipients:

-
-

APPENDIX IV

ANNUAL REPORT ON CONFORMANCE TO ENERGY BENCHMARKS

(attached to the Circular No. 24/2017/TT-BCT dated November 23, 2017 of the Minister of Industry and Trade)

Paper mills use the following sample report:

Sample report

(Intended for paper mills)

REPORT ON CONFORMANCE TO ENERGY BENCHMARKS

Year...

To - Department of Industry and Trade of city/province

[Paper mill's name] is submitting the report on implementation of the plan of the year [xxxx] prepared on [././.....]

| | |
|--|---|
| Date (dd/mm/yyyy) of receipt of the report | [To be completed by Department of Industry and Trade] |
| Date (dd/mm/yyyy) | [To be completed by Department of Industry and Trade] |

Sub-sector:

Paper mill's name:

Address:[District's name] [Province's name

Telephone number: Fax:, Email:.....

Subsidiary of (parent company's name):

Address: [District's name] [Province's name

Telephone number: Fax:, Email:

Owner: (State-owned/other economic sector)

I. Facts about reporting paper mill and its products

| | |
|-------------------|--|
| Year of operation | |
|-------------------|--|

Production capacity

| Production capacity Product name | Unit of measure (tonne/year) | Designed production quantity | Reporting year's production quantity |
|-------------------------------------|---------------------------------|---------------------------------|---|
| | | | |
| | | | |
| | | | |
| | | | |

Current SEC amounts (*Previous year's report data*)

| <i>Fuel classification</i> | <i>Volume</i> | <i>Unit of Measure</i> | <i>Description of purposes</i> | <i>Consumed energy, expressed in MJ</i> |
|----------------------------|---------------|------------------------|--------------------------------|---|
| Electricity | | kWh | | |
| Fossil coal | | Tonne | | |
| Fuel oil | | Tonne | | |
| Diesel oil | | Tonne | | |
| Gasoline | | Tonne | | |
| Combustible gas | | m ³ | | |
| Coke | | Tonne | | |
| Coal gas | | m ³ | | |
| Outsourced steam | | Tonne | | |
| ... | | | | |

II. Assessment of conformance to energy benchmarks in 201..... [xxxx]

- a) Specific energy consumption (SEC): (*calculated according to the formula given in Appendix I*).
- b) Improved SEC rate compared to the previous year: ($= [(SEC_{previous\ year} - SEC_{present}) / SEC_{previous\ year}] \times 100\%$).
- c) Estimated SEC_{expected} in the following year.
- d) Possibilities of conformance to energy benchmarks as planned.
- e) Recommended solutions (where necessary) and plans aimed at conforming to energy benchmarks

Reporting date [.../.../...]

Prepared by

(Sign and write full name)

Legal representative

(Sign and stamp)