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TonenGeneral Sekiyu K.K.  
Contact:  
EMG Marketing Godo Kaisha  
Public and Government Relations  
Tel: 03-6713-4400

## **TG Cited for Achievement of Energy Conservation Law Energy Benchmark**

TonenGeneral Sekiyu K.K. (head office: Minato-ku, Tokyo; president: Jun Mutoh; herein referred to as TonenGeneral) was cited on the website\* of the Ministry of Economy, Trade and Industry's Agency for Natural Resources and Energy on July 25, 2012 for having achieved the energy benchmark (EBM) based on the Law Concerning the Rational Use of Energy (Energy Conservation Law).

Evaluation was based on reported results for fiscal year 2011 of 14 petroleum companies in Japan. Of these companies, TonenGeneral and its group company Kyokuto Petroleum Industries were the only two that achieved the benchmark.

Calculations based on information on the website indicate that TonenGeneral refineries are more 15% efficient, compared to the industry average in Japan. And it means that the company can expect a cost reduction of approximately 15 billion\*\* yen per year.

Since the oil crises of the 1970's, the TonenGeneral Group has played an industry-leading role in energy conservation efforts through vigorous investment in heat recovery units and other initiatives. Utilizing its Global Energy Management System to the fullest, the company regularly implements energy conservation initiatives at its refineries and chemical plants.

TonenGeneral's Sakai refinery in particular, with the highest efficiency of all the refineries in the company's group as a result of its energy-saving, high-efficiency facilities as well as its rigorous operational controls and follow-up system, contributed significantly to the achievement of the benchmark.



TonenGeneral Sakai Refinery

TonenGeneral will continue its efforts to lower society's energy costs through energy conservation initiatives.

\* Agency for Natural Resources and Energy website (Japanese):  
<http://www.enecho.meti.go.jp/policy/saveenergy/benchmark/h23/benchmark23.pdf>

\*\* TonenGeneral estimates

## Reference

- The energy benchmark (EBM), an indicator announced by the Japanese government to encourage voluntary energy conservation efforts in the business and industrial sectors, was finalized by the Plant Criteria Subcommittee of the Comprehensive Energy Survey Committee's Energy Conservation Working Group on March 31, 2009.
- The following sectors have been asked to submit regular reports for benchmarking since 2010: 1) blast furnace ironworks, 2) electric furnace steel manufacturing, 3) special electric furnace steel manufacturing, 4) electric power supply and 5) cement manufacturing; and the following since 2011: 6) paper manufacturing, 7) cardboard manufacturing, 8) oil refining, 9) petrochemical base product manufacturing and 10) soda chemicals.
- EBMs have been set in accordance with the respective views of each industry. The EBM for the refining industry has been set based on the following industry views.

1. Demand

As feedstocks for fuel and petrochemicals, oil products are essential for people's daily lives and for industrial activity, and the refining industry must provide a stable supply of oil products to meet demand. The volume of oil products produced fluctuates with demand, and this has a great impact on the industry's energy consumption.

2. Facility configuration

Oil products span a wide range from heavy oil to diesel, and production must be adjusted in accordance with demand. However, as individual distillates cannot be produced in isolation, a variety of distillates is produced simultaneously. If the recent demand trend toward lighter products continues, additional heavy oil cracking units will be needed. Therefore, the optimal facility configuration for each refinery will differ according to product profiles and types of crude refined, and energy consumption volumes will differ as a result.

3. Benchmark indicator

Due to the characteristics of the refining industry described above, an energy efficiency index reflecting the production and facility configurations of the various refineries is desirable as an industry benchmark. Thus, the benchmark indicator is obtained by dividing the actual volume of energy consumed by the standard energy volume.

$$\text{Benchmark indicator} = \frac{\text{Actual volume of energy consumed}}{\text{Standard energy volume}}$$

$$\text{Standard energy volume} = \sum (\text{unit coefficient} \times \text{unit throughput volume})$$

4. The standard energy volume above is the total of the products of the coefficients and throughput volumes deemed appropriate for the different refining units (five units common to and owned by each refinery: atmospheric distillation unit, vacuum distillation unit, catalytic reformer, indirect desulfurization unit, catalytic cracking unit) and is the amount of energy normally consumed for that facility configuration and throughput volume. Therefore, the benchmark indicators shown by the ratio of the standard energy volume and the actual volume of energy consumed reflect the facility configurations and throughput volumes of the different refineries. In addition, as the coefficients for the different units are derived from worldwide averages (172 refineries) of energy volume consumed per throughput volume, evaluation by energy efficiency indicators using this standard energy consumption is recognized in the oil industry worldwide.
5. The Ministry of Economy, Trade and Industry has set the target for the Energy Conservation Law as 0.876, one standard partial difference (0.046) from the 2008 Japan average (0.922). TonenGeneral's reporting for 2011 indicated a figure of 0.808, significantly lower than the industry average, indicating a high rate of efficiency.