

2018 Student Design Competition: Utility and Service Life Overview

General

The purpose of this document is to illustrate the utility rate structures and elements of building life cycle expectancy for the facility to be renovated as part of the system selection and ISBD Design Competitions. This information is also used in the system selection competition for life cycle costing. It should be noted that these rates may not reflect the reality of the actual energy rates in this region of Turkey. Regardless, teams should use the below values for the 2018 Design Competition.

Utilities

Electricity distribution in Turkey is divided into 21 separate regions. The local electricity provider for this region is Boğaziçi Electricity Distribution Company. Reliability is considered below average due to the increases in energy usage due to the improving economy and the slow progress of new installed infrastructure. Average power reliability is around 86% but is improving.

Commercial rates are as follows for low voltage, 50 hertz power:

Day Rate Period	06:00 to 17:00	12.50 US\$ cent/kWh
Peak Rate Period	17:00 to 22:00	18.00 US\$ cent/kWh
Night Rate Period	22:00 to 06:00	9.75 US\$ cent/kWh

Monthly maximum commercial demand rates are set at the contract signing at 2.50 US\$/kW in 25 kW blocks for peak demands set during the peak period only. There are no seasonal rate periods.

Purchase guarantee. Default electricity suppliers in an area must purchase a certain amount of electricity from companies participating in the RER support mechanism. Where the renewable generator chooses to sell their capacity to the RER support mechanism, a minimum price per kWh is set by regulation. The current minimum rates are:

- Hydroelectric generation plant, US\$ cent/kWh 7.3;
- Wind power plant, US\$ cent/kWh 7.3;
- Geothermal power plant, US\$ cent/kWh 10.5;
- Biomass energy plant (including landfill gas), US\$ cent/kWh 13.3;
- Solar power plant, US\$ cent/kWh 13.3.

Generation licenses for solar facilities. The Electricity Market Law No. 6446 (EML) states the following renewable energy facilities are exempt from needing to obtain a generation license from the EMRA or incorporate a company:

- Renewable energy generation plants which have a maximum installed capacity of 1 MW;
- Renewable energy generation plants where 100% of the energy generated is consumed on the same site, without feeding any capacity into the transmission or distribution system.

Propane gas is available to the building by delivered bottle at a simple consumption rate of \$7.91/ Mcf.

Natural gas is available at US\$0.586/ therm or US\$0.02/ kWh or US\$5.86/ MBTU's at 5 PSI from the main at the street.

The water and sewer rate is a flat consumption rate of US\$2.86 /cubic meter.

Utility rate structures shall be expected to rise at the following rates of escalation.

- Electrical cost will rise at the annual rate of 3.5%
- Propane Gas cost will rise at the annual rate of 3%
- Water and Sewer will rise at the annual rate of 2.5%

Building Service Life

The Building is considered a “Long Life” service building and therefore is defined by ASHRAE Standard 189.1 (latest addition) to have an expected minimum service life of 50 years. All building decisions related to the building composition, building structural elements, building systems, and building operation shall include a 50 year life cycle study as the building owner expects a sustainable approach to all building design, construction and operational elements. Student teams shall include this basis with all building analysis. To complete the life cycle study, the building owner expects the following elements to be included with any analysis.

- General Inflation rate for future cost items (replacement items, maintenance and anticipated future costs) will be 3%
- Owner's Rate of Return for monetary decisions (this is to be used for bring future costs back to present net worth dollars) will be 4%. The Life Cycle Analysis shall illustrate a 50-year study and bring all costs back to a total present value sum for each alternative so the building owner understands in present dollars which alternatives represent the best life cycle value.