



Boğaziçi Üniversitesi

'UI GreenMetric World University Ranking 2016' Taslak Başvuru Dosyası

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Boğaziçi Üniversitesi Sürdürülebilir Kalkınma ve Temiz Üretim Uygulama ve Araştırma
Merkezi (BU-SDCPC)

Boğaziçi Üniversitesi Çevre Bilimleri Enstitüsü

UI GREENMETRIC

1 Setting and Infrastructure (SI)

1.1 Type of higher education institution

Comprehensive

1.2 Climate

Mediterranean

1.3 Number of campus sites

8

Table 1: Bogazici University Campus Locations

| Name of the Campus | Location of the Campus |
|---|---|
| Güney Kampüs / South Campus | Bebek/ Beşiktaş/ İstanbul |
| Hisar Kampüs / Hisar Campus | Hisarüstü, Nispetiye Caddesi, Rumelihisarı, Sarıyer/İstanbul Türkiye |
| İzник Kampüs / İzник Campus | Selçuk Mah. İzник/ Bursa |
| Kandilli Kampüs/ Kandilli Campus | Kandilli Mahallesi, Vaniköy Caddesi, Eşref Bitlis Sokak, Üsküdar/İstanbul |
| Kuzey Kampüs / North Campus | Bebek/ Beşiktaş/ İstanbul |

| | | |
|---|---|-------------------|
| Sarıtepe-Kilyos Kampüs / Sarıtepe-Kilyos Campus | Boğaziçi Üniversitesi, Sarıyer/İstanbul | Sarıtepe Kampüsü, |
| Uçaksavar Kampüs / Uçaksavar Campus | Cengiz Topel Caddesi, Özden Sok., Beşiktaş/İstanbul, Türkiye | Rumelihisarı, |
| Tarsus Çırçır Fabrikası / Tarsus Ginning Factory | - | |

1.4 Campus Setting

Urban

1.5 Total campus area (meter square)

Table 2 : Campus Areas

| Name of the Campus | Area of the Campus (2015)* | Area of the Campus (2016)** |
|--|-----------------------------------|------------------------------------|
| Güney Kampüs / South Campus | 267 115 | 271 482 |
| Hisar Kampüs / Hisar Campus | 21 457 | 18 981 |
| İznic Kampüs / İznic Campus | 4 214 | 4 214 |
| Kandilli Kampüs/Kandilli Campus | 305 689 | 308 878 |
| Kuzey Kampüs / North Campus | 56 680 | 58 092 |

| | | |
|---|-----------|-----------|
| Saritepe-Kilyos Kampüs / Saritepe-Kilyos Campus | 969 600 | 1 197 799 |
| Uçaksavar Kampüs / Uçaksavar Campus | 44 351 | 41 481 |
| Tarsus Çırçır Fabrikası / Tarsus Ginning Factory | 3 000 | 2900 |
| TOPLAM / TOTAL | 1 672 106 | 1 903 827 |

* 2015 data is obtained from the university web page

** 2016 data is obtained from Boğaziçi University General Directorate of Construction. The calculations are made by KARTAL HARİTA İMAR İNŞ.LTD.ŞTİ.

1.6 Total ground floor area of buildings (meter square)

86317

1.7 Total main campus buildings area (meter square)

1.8 Total main campus smart building area (meter square)

1.9 Total parking area (meter square)

1.10 Area on campus covered in vegetation in the form of forest (%)

66,8%

1.11 Area on campus covered in planted vegetation (%)

26,4%

1.12 Total area on campus for water absorption beside forest and planted vegetation (percentage)

6,8%

1.13 Total number of online students (part time and full time)

0

1..14 Number of students including part time and full time students

13968 *

* 2015/2016 spring semester

1..15 Number of academic and administrative staff

Administrative staff: 943,

Academic Staff: 971; Including ÖYP*: 1022

* Öğretim Üyesi Yerleştirme Programı (Teaching Staff Training Program)

1..16 University budget for sustainability effort (%)

Rektörlüğe yazı yazıldı

2 Energy and Climate Change (EC)

2..1 Energy efficient appliances usage are replacing conventional appliances

Partly replaced

Lighting with LED technology is firstly applied in the road of South Campus and Natuk Birkan Building in 2012. Feasibility studies continue for the other buildings. Usage efficiency increase 30% since LED lamps are 10 times more long-lasting than classic lamps turning some energy into heat. Lighting with LED technology is started to be applied in the North Campus by considering the increase of efficiency, as well.

Table 3: LED Lamp Usage in Bogazici University

| Year | Application Location | Supply Rate for the Application Location, % | Provided Energy Saving Rate, % | Estimated Prevented CO ₂ Release Amount, kg CO ₂ /yr | Investment Cost, TL | Investment Cost, USD |
|------|----------------------|---|--------------------------------|--|---------------------|----------------------|
| 2012 | Natuk Birkan | 100% | 30 | 820 | 50,000 | 27,778 |

| | | | | | | |
|------|-------------------|------|----|-----|---|---|
| 2012 | South Campus Road | 100% | 30 | 800 | ? | ? |
|------|-------------------|------|----|-----|---|---|

2..2 Smart Building implementation

Implemented in less than 30% of the total building area

2..3 Renewable energy produce inside campus

Solar power

Wind power

Clean biomass?

Combine heat and power?

2..2 Renewable energy usage policy

Not as policy but applications exist in our university

Wind power

Windpower Plant(LINK)

Table 4: Wind Power Application in Bogazici University

| Year | Application Location | Technical Application | Installed power | Supply Rate for the Application Location, % | Provided Energy Saving Amount, kwh/yr | Estimated Prevented CO ₂ Release Amount, kg CO ₂ /yr | Investment Cost, TL | Investment Cost, USD |
|------|----------------------|--|-----------------|---|---------------------------------------|--|---------------------|----------------------|
| 2014 | Kilyos Campus | Windpove Plant (RES) Wind Measureme nt Mast | 1000 kWp | 140% | 1,034,550 | 900,000 | 4,222,000 | 2,020,096 |

Solar power

Hot Water System with Sun Collector

Hot water systems with sun collector are generated from the equipments such as plane collectors collecting solar power the storage where the warmed water is stored and insulated pipes connecting this to parts and pump and controller. These studies are planned to be increased in our school. 22% of hot water need of 1. Male dormitory is provided by hot water system of with sun collector applied in 2011.

Table 5: Hot Water System with Sun Collector Application in Bogazici University

| Year | Applicati on Location | Installed power | Supply Rate for the Application Location, % | Provided Energy Saving Amount, kwh/yr | Estimated Prevented CO ₂ Release Amount, kg CO ₂ /yr | Investm ent Cost, TL | Investm ent Cost, USD |
|------|-----------------------------------|-----------------|---|---------------------------------------|--|----------------------|-----------------------|
| 2011 | South Campus First Male Dormitory | 54.42 | 22 | 62,560 | 14,640 | 43,100 | 26,770 |
| 2015 | Tarsus History and Culture Center | ? | 100 | ? | ? | 10,000 | 3,846 |

Application of photovoltaic panel

Power of photovoltaic panels applied in North Campus 3.dormitory in 2009 and providing power generation is 20520 kWp and supplies 30% of power generation need of the dormitory.

Power of photovoltaic panels applied in North Campus 4.dormitory in 2010 and providing power generation is 20160 kWp and supplies 30%of power generation need of the dormitory.

Power of the panels existing in South Campus Faculty of Economics and Administrative Sciences in 2013 and providing power generation is 0,480 kWp. Panels provide 100% of power generation power required for totally 15 LED lamps in corridors of faculty.

Power of photovoltaic panels applied in Kandilli Campus National Earthquake Monitoring Center (UDIM), Tsunami Monitoring Building in 2013 and providing power generation is 16032 kWp.

Power of panels constructed in North Campus and Superdorm in 2013 and providing power generation is 0,480 kWp. Panels provide 100% of power generation need for night lighting in the area where they are constructed.

Power of panels constructed in leaning roof of Mersin Tarsus Museum in 2014, October and providing power generation is 19500 kWp. Panels are designed to provide 100% power generation need of the museum during sunny days.

Hot water system with sun collector and applications of photovoltaic panel are constructed by the studies conducted mutually by Sustainable Development and Clean Production Applications and Research Center(BU-SDCPC), Bogazici University Directorate of Construction and Technical Works, Industrial Plant Design Ltd. Şti.

Table 6: Application of photovoltaic panel in Boğaziçi University

| Year | Application Location | Installed power | Supply Rate for the Application Location, % | Provided Energy Saving Amount, kwh/yr | Estimated Prevented CO ₂ Release Amount, kg CO ₂ /yr | Investment Cost, TL | Investment Cost, USD |
|------|----------------------------|-----------------|---|---------------------------------------|--|---------------------|----------------------|
| 2010 | North Campus 3th Dormitory | 20.16 | 30 | 23,174 | 14,300 | 193,000 | 122,152 |
| ? | Faculty of Economics and | 0.48 | 100% of the energy | 1,620 | 1,000 | ? | ? |

| | | | | | | | |
|------|--|--------|-------------------------|--------|--------|---------|---------|
| | Administrative Sciences Building | | needed for 15 Led light | | | | |
| 2011 | North Campus 4 th Dormitory | 20.16 | 30 | 23,174 | 14,300 | 400,000 | 248,447 |
| 2013 | Kandilli Campus UDİM Building | 16.032 | ? | 18,430 | 11,370 | ? | ? |
| 2014 | North Campus Turgut Noyan Building | 14.4 | ? | 16,550 | 8,885 | ? | ? |
| 2015 | Tarsus history and Culture Center | 19.5 | ? | 22,415 | 13,830 | ? | ? |

2.3 Electricity usage per year (in kilo watt hour)

Table 7: Annual Electricity Usage of Campuses(kw)

| Name of the Campus | Electricity consumption (kw/year) |
|---|-----------------------------------|
| Güney Kampüs / South Campus | 3 769 752 |
| Hisar Kampüs / Hisar Campus | 1 132 032 |
| İzник Kampüs / İzник Campus | 26 640 |
| Kandilli Kampüs/Kandilli Campus | 1 492 404 |
| Kuzey Kampüs / North Campus | 7 149 048 |
| Sarıtepe-Kilyos Kampüs / Sarıtepe-Kilyos Campus | Unknown* |
| Uçaksavar Kampüs / Uçaksavar Campus | 44 351 |

| | |
|---|-----------|
| Tarsus Çırçır Fabrikası / Tarsus Ginning Factory | No record |
|---|-----------|

* Although the energy generated is much more than needed in the campus, the electricity cost is unknown. Because due to an agreement with TEDAŞ (Turkish Electricity Distribution Cooperation) partial payment is done.

2..4 Energy conservation program

Policy preparation

2..5 Elements of green building implementation as reflected in all construction and renovation policy

Full-day natural lighting

Building efficiency

South Campus I. Male Dormitory (Hamlin Hall)

The dormitory became entitled to receive LEED Gold Certificate in September 2012 by making comprehensive improvements complying with sustainable areas, water efficiency, energy and atmosphere, sustainable and local material use in indoor and exterior, roof and surroundings of building criteria in 2011. Besides being the first university building having LEED Gold Certificate, it is also the first historical building with LEED Certificate.

Bogazici University Kandilli Observatory and Earthquake Research Institute National Earthquake Monitoring Institute (UDIM)

The building was constructed complying with maximum energy and water efficiency, renewable energy applications, storm water recovery applications, internal air quality and more daylight utilization criteria and became entitled to receive LEED Gold Certificate in February 2015. 39% less energy than average energy consumption values is consumed in UDIM Building. The investment cost for LEED Gold Certificate was 1.313.000,00 TL

2..6 Climate change adaptation and mitigation program

Program Preparation

2.7.a Greenhouse gas emission reductions policy

Program Preparation

2.7.b Do you calculate your campus yearly carbon emission?

Yes

2.7.c If you answer yes in 2.7b, please provide total carbon footprint (CO2 emission in the last 12 months, in metric tons)

3 Waste (WS)

3.1 Program to reduce the use of paper and plastic in campus

3.2 Recycling program for university waste

Partial

Recyclable Wastes

150 easy-to-use recycle bins donated by Sariyer Municipality were used in our university in 2012 within the collection of solid waste by decomposing in the source and were placed in different areas of our university buildings as a result of data got from “ Waste Producer Information Assessment Form” in quartet sets as written “metal-glass”, “paper”, “plastic”, “organics” on them. The places of recycle bins determined by former study were controlled again due to reduction in efficiency of blue bins and the importance given to recycling and new bins are replaced.160 bins in quartet sets and as written paper, plastic, organics, metal-glass wee placed in buildings in South Campus.

Electronic Wastes:

Electronic wastes and all the wastes in the university including precious metal are taken by Machine Chemistry Institute Institution (MKEK) every 5 months. That transferring of scrap materials (metal alloyed) to MKE Scrap Operation Directorate by means of selling is required is indicated in accordance with the law no.7/2156 of Cabinet Decree. Wastes in this scope in our university are stored in locked boxes in the storehouse under the north car park. The project of collection of electronic wastes saved in many houses in containers placed in determined areas in the campus, initiated by university students is planned to begin by the end of 2014 with the cooperation of related firm. Classic taps in our university buildings are replaced by sensor-fitted taps providing water saving in return for electronic wastes to be collected within the project. Pre-interviews with possible project partners continue to exist.

3.3 Toxic waste handled

Completely contained, inventoried and handled

Toner Wastes:

Toner waste collection forms and informing notes are conveyed to all the department secretarial and building chiefs with the aim of administration of toner wastes every year and on the other hand, toner bags required for the application are distributed to all the department secretarial. The cooperation for 2013 is constructed with Hewlett Packard (HP) for recycling of toner waste. 430 toner wastes are conveyed to HP'S authorized company Anel Doğa Engre Recycling End. A.Ş at the end of the year and are sent to interim storage for dangerous recycling of toner waste. There has been no attempt to new cooperation yet.

Hazardous Wastes:

Wastes generated from hazardous materials including the mixtures of lab chemicals or lab chemical including hazardous materials, created in our labs of Chemistry, Chemical Engineering, Physics, Molecular Biology and Genetics, Biomedical Engineering Institute and Ecological Sciences Institute, coded in 16 05 06 are detracted from our university in the dates indicated in the following table in cooperation with Ecological Energy A.Ş. with licenced vehicles in accordance with the instructions no.25755 Control of Hazardous waste

Table 8: Laboratory Waste and Waste Toner Removal in Bogazici University

| Year | Application Location | Technical Application | Amount | Investment Cost, TL | Investment Cost, TL |
|------|--|--|----------|---------------------|---------------------|
| 2011 | Hisar/ Kuzey/ Kandilli Campuses | Disposal of Hazardous Wastes generated in laboratories | 5,800 kg | 25,000 | 13,889 |
| 2012 | | | 2,200 kg | | |
| 2013 | | | 4,500 kg | | |
| 2014 | | | 2,880 kg | 15,000 | 7,177 |
| 2015 | | | 2,600 kg | | |

| | | | | | |
|------|------------|-----------------------|---------------------|---|---|
| 2013 | University | Waste Toners Disposal | 430 adet atık toner | - | - |
|------|------------|-----------------------|---------------------|---|---|

Medical Wastes:

Medical wastes generated from infirmary and Molecular Biology and Genetics department in our university are stored in the storage of medical waste in accordance with the instruction no.21586 numbered “Control of Medical Waste” and collected by Beşiktaş Municipality by licenced vehicles every Thursday.

Medical wastes generated in our university are going to be collected by İSTAÇ A.Ş. as of 2015, January.

Radioactive Wastes:

Low-activated radioactive wastes formed in Molecular Biology and Genetics Department are detracted from our university periodically in cooperation with Turkish Atomic Energy Authority (TAEK) and Çekmece Nuclear Research and Training Center and in accordance with the instruction no. “Administration of Radioactive Waste”. 50 kg radioactive wastes are detracted in May,2012. 50 kg saved waste are going to be detracted as of the end of 2014 in accordance with related instructions.

The radioactive wastes type of 3H and 14C generated as a result of laboratory studies in our university do not spread radiation the outside of the container where they exist. These wastes conserved as closed are collected in an equipment or a device and are preserved with unbreakable and water-proof objects.

3.4 Organic waste treatment

None of the options are suitable for our university. Organic wastes are removed from campus to sent to landfill by municipality

3.5 Inorganic waste treatment

Taken off campus to a dump site

3..6 Sewerage disposal

Disposed untreated to waterways

Or Centralized treatment before disposal

3..7 Policy to reduce the use of paper and plastic in campus

Policy preparation

4. Water (WR)

4..1 Water conservation program

Program preparation

4..2 Water recycling program

Program preparation

4..3 Water efficient appliances usage are replacing conventional appliances

Partly replaced

Grey Water Recycling System

Grey water composing the biggest percentage of domestic waste water with the share of 75% volumetrically is the waste water except toilet water. There are 2 buildings including grey water recycling systems in our university.

Each of grey water recycling systems applied in South Campus 1. male dormitory in 2010 and in North Campus 4.dormitory in 2014 was designed in the way that they recycle 16m³/day grey water in a day

Rainwater Recycling System:

Rainwater recycling system collected from the roof of Kandilli Campus National Earthquake Monitoring Center(UDIM) Building was put into usage in 2013. Rainwater collected in 46 m³ storage is used for garden irrigation, cleaning and reservoirs.

Rainwater Recycling System: Rainwater recycling system collected from the roof of North Campus ETA Building was put into usage in 2014. Rainwater collected in 20 m³ storage is used for garden irrigation.

Hisar Campus is seen as the most appropriate campus for collecting rainwater since its topography is suitable for this application. The estimated amount of rainwater to be collected from the roofs of Hisar Campus Buildings is calculated as 1747m³/year. Rainwater collected four times in a year in 40m³ volumed storage with the designed rainwater recycling system can be used as reservoirs and cleaning water by refining in Hisar Campus Buildings. Feasibility studies continue to exist.

Water Saving Cartridges

Water saving is given importance within the studies of green campus. That water saving cartridges inserted all of the taps in dormitories of our university provide 35% water saving is determined by counter measurements.

4.4 Treated water consumed

Percentage will be given

5 Transportation

5.1.a Number of campus bus operated in your university

Personnel vehicle: 61

Shuttle busses: 12

5.1b Average passengers of each campus bus

5.1c Total trips for campus bus service each day

5.1d Number of cars owned by your university

5.2a Number of cars entering the university daily

Cannot be determined. However number of university stickers provided for

Students: 400

Academic and Administrative staff: 1300

Alumni: 120

5.2b Number of motorcycles entering the university daily

5.3 Number of bicycles that are found on campus on an average day

BUSiklet'ten cevap bekleniyor.

5.4 Transportation policy designed to limit the number of motor vehicles used on campus

Policy preparation

5.5 Transportation policy designed to limit or decrease the parking area on campus

Policy preparation

5.6 Campus bus service

Available (free service)

5.7 Bicycle and pedestrian policy on campus

5.8 The approximate travel distance of a vehicle each day inside campus only (in kilometers)

Approximately 10 km

6 Education

6.1 Number of courses related to environment and sustainability offered

6.2 Total number of courses offered

Rektörlüğe yazı yazıldı.

6..3 Total research funds dedicated to environmental and sustainability research (in US Dollars)

Rektörlüğe yazı yazıldı.

6..4 Total research funds (in US Dollars)

Rektörlüğe yazı yazıldı.

6..5 Number of scholarly publications on environment and sustainability published

6..6 Number of scholarly events related to environment and sustainability

6..7 Number of student organizations related to environment and sustainability

6..8 Existence of a university-run sustainability website

Available