

BUSTA 1

1. Il candidato illustri i documenti contabili nella fase di esecuzione di un'opera pubblica.
2. Il candidato illustri il ruolo e funzioni del responsabile del procedimento nella fase di esecuzione e collaudo di un'opera pubblica.
3. Il candidato illustri il significato dell'acronimo REI.
4. Il candidato illustri la funzione ed il contenuto del Capitolato Informativo nell'ambito del BIM.

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The sustainable energy policy plan of Ghent University aims to reduce energy consumption by 20% by 2020, in relation to 1998. In this, a distinction is made between the new-build projects realised after 2009: the energy consumption must be minimised for these recent projects, whereby we will generate the additional energy requirements ourselves, whether or not under our management.

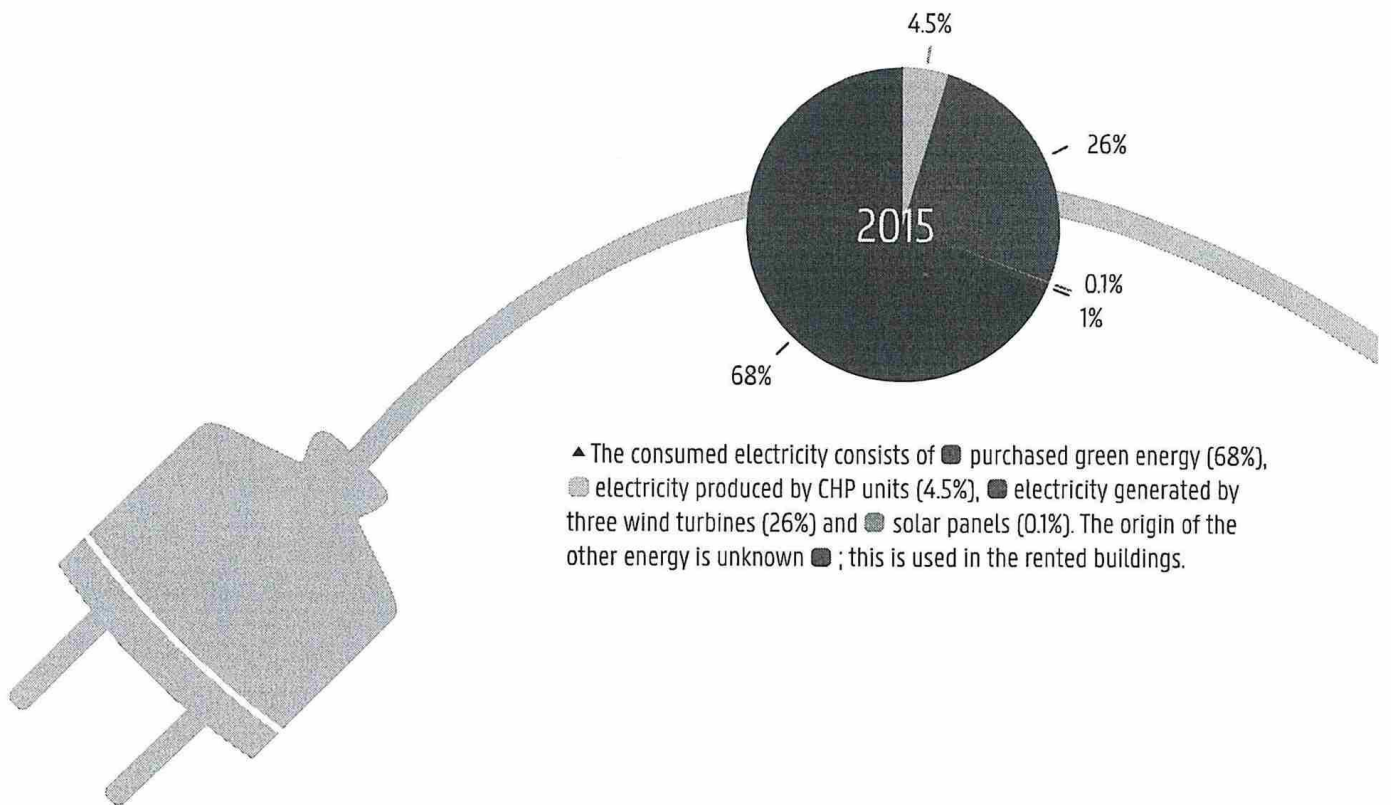
Energy and water consumption

Energy consumption

- ▶ The buildings at Ghent University are heated with natural gas (c. 71,500 MWh), district heating (c. 17,000 MWh) and fuel oil (c. 2,100 MWh). Ghent University consumes 53,000 MWh of electricity.

Ghent University is aiming to bring all its buildings down to almost zero-energy. As such, the construction of the new restaurant on the Merelbeke campus and the renovations of Dunant I and Blok I and part of Blok II of the Technicum follow the BEN (almost energy neutral) principal. Heat pumps have been installed in the new iGent building on campus A of Tech Lane Ghent Research Park with the aim of using the warmth from the data centre to partly heat the building.

On the Coupure and Ledeganck campuses, cogeneration facilities (CHP) have been operational since the end of 2014. This means that part of the heating for the buildings is provided by the residual heat from electricity production. Biomass facilities have also been installed on the Coupure campus. This installation is powered by untreated waste wood (dunnage from the harbour, waste wood from forest management etc.) originating from areas within a 250km radius of the campus. The installation is provided with filters, to ensure the emission of fine dust is much lower than permitted levels. There were some teething problems at the start-up stage, and so the facilities have only just become operational.



▲ The consumed electricity consists of purchased green energy (68%), electricity produced by CHP units (4.5%), electricity generated by three wind turbines (26%) and solar panels (0.1%). The origin of the other energy is unknown; this is used in the rented buildings.

SV RPO Juv

BUSTA 2

1. Il candidato illustri le differenze ed i contenuti del Capitolato Generale d'Appalto e del Capitolato Speciale di un'opera pubblica.
2. Il candidato illustri quali sono i documenti di programmazione delle opere e quali sono i documenti legati agli stessi.
3. Il candidato illustri il significato dell'acronimo CAM.
4. Il candidato illustri la funzione del BIM nei lavori complessi, anche in relazione alla vigente normativa.

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Energy policy plan

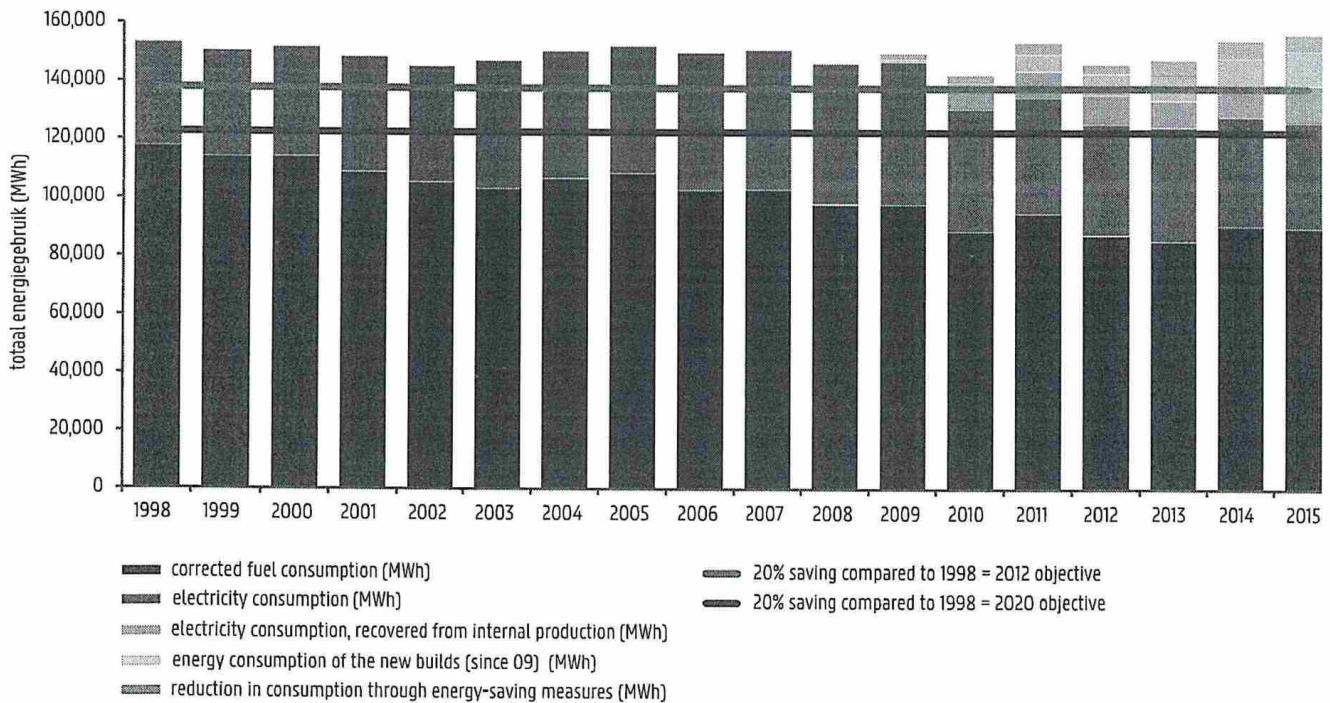
The energy policy and the specific policy tools and choices of Ghent University in relation to construction and renovation are well anchored in the building policy. The provision for sustainable energy measures is supplemented annually with proven savings, whereby investments can be made continually in cost-effective energy measures. Ghent University follows a renovation guideline, in which a number of minimum energy requirements are imposed on renovations. Moreover, with new builds and complete renovations, we aim for almost energy neutral buildings.

Yet the positive progress towards the 2020 objective that has been achieved in previous years is again offset with the figures from both 2014 and 2015. The warm winters – and therefore less reliable corrections – play a role in this, but they are not the only reason. The energy consumption of the

buildings continues to increase and, for the renovated buildings in particular, this has a major impact.

It is therefore time for a new step: infill and shared use. In order to achieve this we require centralised management and accountability for the use of the space and energy. Additionally, there is often a lack of aftercare for the renovated/new buildings or installations. High-tech buildings require greater attention, as do numerous new installations (rainwater recuperation systems, heat pumps and solar boilers) if they are to operate efficiently. Once a building or installation is operational, we must closely monitor numerous parameters. The building and the installation must be continually adapted to the changing user profile and number of users of the building.

Evolution of energy objectives



▲ The total corrected energy consumption in 2015 decreased by 10.5% compared to 1998, if we exclude new builds constructed after 2009 from the calculations. The increased consumption of the new builds (c. 11,881 MWh) is further compensated for by our own green energy production (c. 12,680 MWh).

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BUSTA 3

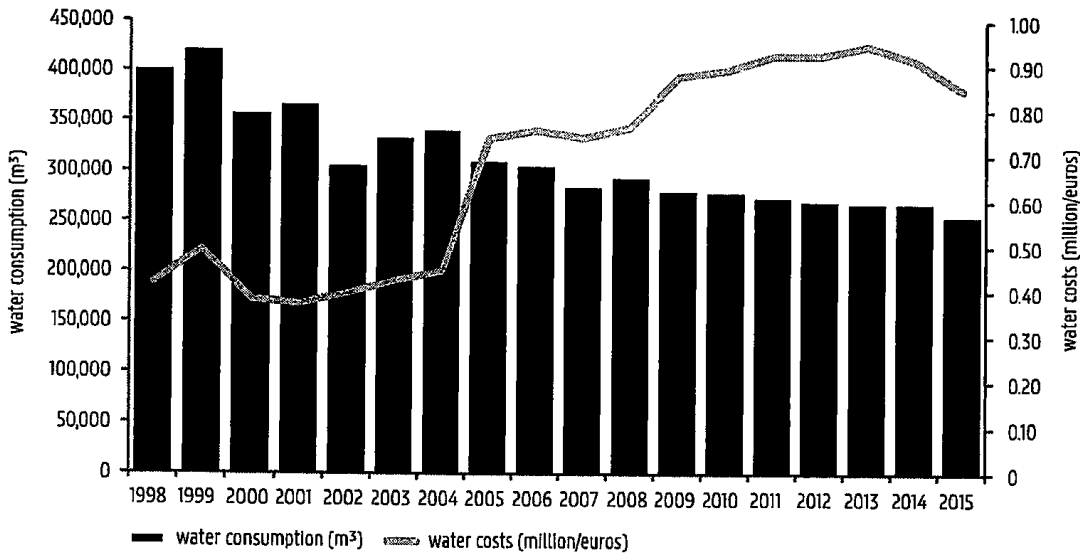
1. Il candidato illustri la disciplina del subappalto nell'ambito dei lavori pubblici.
2. Il candidato illustri il ruolo e funzioni del responsabile del procedimento nella fase di programmazione ed affidamento di un'opera pubblica.
3. Il candidato illustri la funzione dei protocolli di sostenibilità energetica ed ambientale degli edifici e ne citi alcuni esempi.
4. Il candidato illustri le figure professionali nell'ambito del BIM.

SI RP Jm

Water consumption

Ghent University largely uses municipal water (c. 255,000 m³ in 2015). A smaller share is taken up by groundwater (c. 2,450 m³) and rainwater (c. 10,500 m³). In the university sports complex, GUSB, the swimming pool water is reused, after filtration, to flush the toilets (1,379 m³ in 2013 and 1,272 m³ in 2014) and the Merelbeke campus now uses greywater coming from the water purification facilities (c. 4,800 m³/year). This use of water has not had any negative consequences for the water source concerned.

Evolution of water consumption and costs

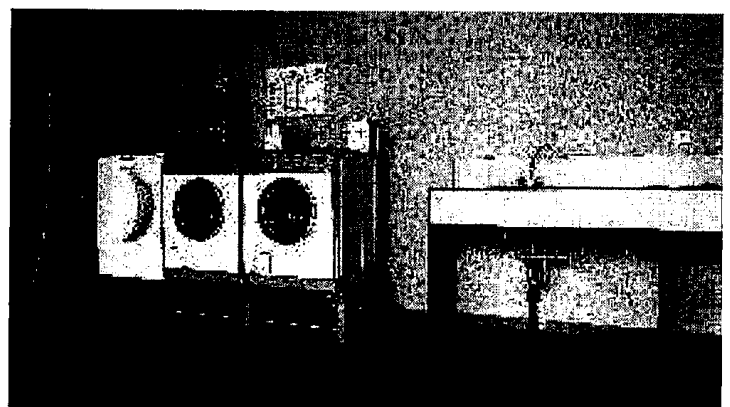


▲ Since 1998, water consumption has decreased by 36%; the cost price has since doubled. Water consumption in 2015 decreased by 5% compared to 2014.

Water reduction

As a result of water audits we can respond quickly to rapid increases in consumption, for example due to a leak, dripping taps or changes in lab processes etc.

The use of rainwater is compulsory by way of the environmental permit and the building permit. By including neighbouring buildings in the water balance of a renovation/new build, the supply and demand of the rainwater can be better aligned. The use of rainwater for sanitary applications is increasing, but still only contributes 2% to total domestic water consumption.



Read more about the energy policy plan in the follow-up reports on www.ugent.be/energie

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