Case Study: Olympic House

The International Olympic Committee Headquarters: Representing Company Values Through Architecture

The International Olympic Committee (IOC) is a not-for-profit independent international organization that is committed to building a better world through sport. It is a global organization, representing the interests of 206 National Olympic Committees around the world and acting as both the guardian of the Olympic Games and the leader of the Olympic Movement. It redistributes more than 90% of its income to the wider sporting movement, helping athletes and sports organizations at all levels throughout the world.

Olympic House; Photo credit: IOC/AZdam Mork

INTERNATIONAL OLYMPIC COMMITTEE

Sustainability is one of the three pillars of Olympic Agenda 2020 – the strategic roadmap for the future of the Olympic Movement and it was of particular interest when the IOC began to construct a new headquarters in May of 2016.

Olympic House

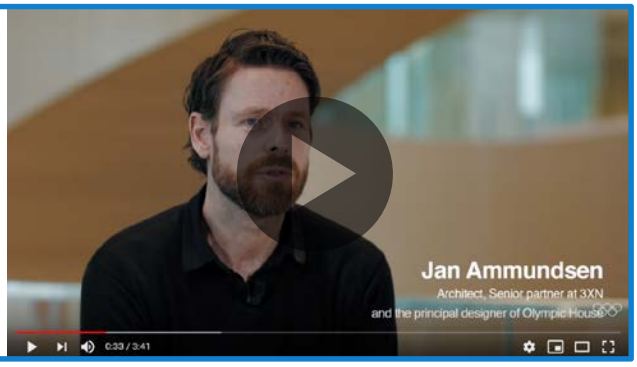
The new IOC international headquarters has received the most points (93) of any LEED v4 Building Design and Construction project to date.

Photo credit: IOC, Adam Mork

Building Facts

- International headquarters of the International Olympic Committee
- Located in Lausanne, Switzerland
- 25,000 square meters
- Basement + ground floor + 3 office floors + roof terrace
- Opened: June 23, 2019
- 500 regular occupants + 15,000 visitors per year

Watch the video to see how Olympic House becomes one of the most sustainable buildings in the world.



Planning a New Olympic House

Previous to the new construction, employees of the IOC were split into four different buildings, distributed across the city of Lausanne, Switzerland, a city that the IOC had been located in for over 100 years. Splitting up the employees was not conducive to large-scale international operations. One central aim of the new headquarters, known as the Olympic House, was to bring these 500 employees to one central location, consolidating space and encouraging collaboration. Upon completion in early 2019, the Olympic House received the most points out of any LEED v4 Building Design and Construction project to date. Replacing the former headquarters building, the Olympic House is located on the shores of Lake Geneva adjacent to the historic Château de Vidy. This choice of location for the new headquarters suggests a strong connection and dedication to both nature and history.

The Olympic House as seen on the shores of Lake Geneva (photo credit: IOC/Luca Delachaux)

In collaboration with the Danish architecture firm 3xn, the IOC used the construction efforts as an opportunity to craft a headquarters that served not only as an office space, but as a representation of their brand. This meant bringing together concepts of collaboration, excellence and sustainability to craft the design of the building. To achieve this, the project team engaged in an integrative design process, bringing together people of disparate expertise to design the best new headquarters possible.

Internal and external collaboration is at the heart of the design of the Olympic House. With its five-ring central staircase linking the various floors and its transparent and collaborative working areas, the building offers a cutting-edge environment for its primary users, hence reflecting the change of mindset of the Olympic Movement and its administration.

The Olympic House is also a unique example of innovative collaboration between many different stakeholders, including some of the IOC's commercial partners (Dow, Toyota and Panasonic), and sustainability certification bodies, local authorities, suppliers and academics, as well as the IOC staff.

PROJECT TEAM

International Olympic Committee	Owner
3xn and IttenBrechbühl	Consortium of architects
ThemaVerde	LEED experts
Ingeni SA	Civil engineer
Emmer Pfenninger Partner	Facade engineer
Weinmann Energies SA	HVAC and SNBS certification experts

Colleagues from 3XN and IttenBrechbühl (Olympic House: The Book)

A meeting between the IOC and representatives of various city departments (Olympic House: The Book)

Circular Economy

The first focus of the construction was to ensure that the new Olympic House followed circular economy principles. This means minimizing waste, while keeping products, components and materials at their highest utility and value through repurposing and reuse; incineration and landfilling should be considered "leakage" and avoided. With this in mind, the IOC had an immediate challenge in their construction. Their site already contained a building, one of the previous offices of the IOC. Architecture firm 3xn took this challenge and reconfigured it into an opportunity to display circular economic principles. At first, they held a design competition, asking candidates to try and retain the existing administration buildings, integrating them into the design of the new Olympic House. However, the project team did not find that any of the designs adequately followed sustainable design principles. For this reason, they opted for a different, and arguably more ambitious, approach.

It was decided that the existing office building was to be carefully deconstructed so as to save and repurpose as much material as possible. Then, this material was repurposed to help build the new Olympic House. Through several innovative strategies, 97% of the former administrative building was reused or recycled.

Promaison was chosen by the IOC to recover and reuse its bathroom equipment. Twenty sets of toilets, sinks taps and mirrors were given to the organization to be dismantled, cleaned and sold as second-hand building materials. This donation allowed jobs for the 25 people who work for the organization

Photo credit: IOC

The original office's concrete was crushed on site and recycled in the foundations of the new Olympic House. This not only saved concrete from going to landfill, but also reduced the amount of new concrete that had to be produced and transported to the site. The Olympic House was the first building to employ this innovation in Switzerland. Additionally, 95% of the total waste from construction was recycled, and thus diverted from landfill or incineration. Not all materials were broken down, however.

Photo credit: IOC/Luca Delachaux

One iconic piece of the old office building was a large marble arch. This arch was preserved and reset in the Olympic House, helping to connect the IOC's past with its future. Finally, the project team donated electric boards and bathroom fittings to local businesses and associations. This reinforced the IOC's dedication to their core principles of unity and sustainability, while simultaneously encapsulating the circular economy practices that the construction embodied.

User Wellness

Another major construction goal of the IOC was to promote user wellness and a high degree of indoor environmental quality. This started with an integration of indoor and outdoor environments, intentionally "bringing the outside in". Ninety percent of regularly occupied spaces within the Olympic House have access to outdoor views, and natural daylight permeates throughout the office. There are also several well landscaped terrace spaces that invite office workers to engage with nature without having to leave the office. There is also great attention given to indoor air quality. Significant efforts were invested in the screening of construction materials and furniture items to only select those materials and items with very low levels of Volatile Organic Compounds (VOCs). This was achieved through a close collaboration with suppliers, who in some cases had to modify their practices or products to meet the LEED requirements on VOCs. The building's highly efficient HVAC system ensures that fresh air is constantly circulated through the space, and that levels of CO2 are kept at comfortable rates. In the pursuit of high air quality, the interior walls were coated with paint formulated using a binder developed by Dow, an Olympic partner. This paint contains a low-VOC, waterborne, styrene-acrylic binder that helps remove formaldehyde from ambient air in buildings, transforming the air pollutants into a harmless vapor.

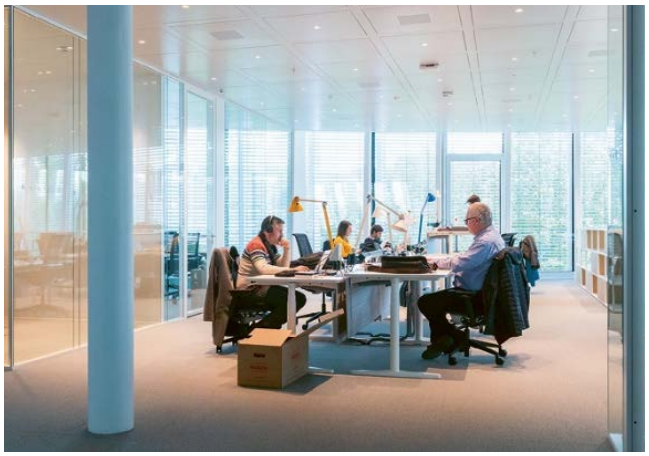


Photo credit: IOC

The Olympic House has many other more visible features that help improve day-to-day life in the building. There is a fitness center available to all employees, helping to promote healthier lifestyles and ensuring that all workers have access to exercise facilities. The entirety of the office is also a "flexible space". This means the interior is easily adjusted to the needs of occupants, allowing them to alter the arrangement of spaces to best suit their needs.

One of the most consequential innovations of the project was to construct a massive staircase in the center of the building. Known as the "Unity Staircase", it is located in a large, open, naturally lit atrium. The Unity Staircase seeks to foster connectivity and collaboration between the different sections of the Olympic House while simultaneously representing the IOC's mission statements of Unity in Diversity, University and Solidarity. Architecture firm 3xn has said of the Unity Staircase that it is a "visual expression of staff and stakeholder unity...and the Olympic spirit, which promotes mutual understanding with a spirit of friendship, solidarity, and fair play" (3xn 2019).

Photo credit: IOC

Resource Efficiency

The third pillar of the Olympic House is resource efficiency. This started with the building's construction through its reuse of materials from the original IOC office onsite. However, the project team did not have a short-term view of resource consumption. The Olympic House has been specifically designed to reduce resource consumption over the course of its lifetime. First, the building made several innovations in water conservation. Low flow faucets and toilets were installed in bathrooms to decrease water use. Additionally, a 300 m3 rainwater harvester was built below the building. The water collected here is stored and utilized for toilet flushing, car washing, and plant watering. This dramatically reduces the freshwater consumption of the facility. In fact, with all of these innovations in place, municipal water consumption is expected to be reduced by 60% as compared to a standard new office building.

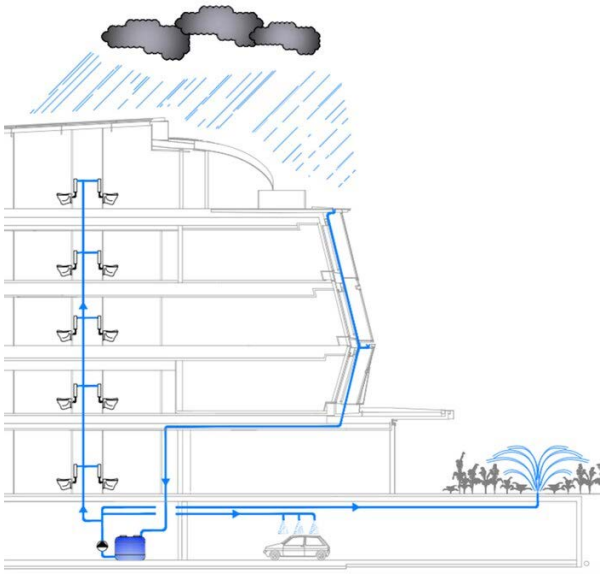


Diagram of the Olympic House's state-of-the-art rainwater harvesting and re-use system

The Olympic House's design has also made significant strides in energy conservation, through various features such as enhanced insulation, heat recovery systems, smart building features or LED lighting. Once again partnering with Dow, the IOC was able to foster the production of several high-efficiency sealants. These sealants will dramatically reduce air leakage, helping to relieve pressure on the HVAC system. These innovations are expected to reduce energy consumption by 35% compared to a standard new office building. In fact, despite being three times larger than the previous office building on site, Olympic House is expected to use a similar amount of energy. In addition, the building is mostly powered by renewable energy, part of which is produced on site through photovoltaic solar panels installed on the roof and water from nearby Lake Geneva used to cool and heat the building thanks to heat exchangers and heat pumps.

Photovoltaic panels on the roof of the Olympic House (Photo credit: IOC)

Accessing water from Lake Geneva adjacent to the Olympic House for use in heat pumps (Photo credit: TSM Perrotet)

Adherence and Excellence in LEED

The new Olympic House is the first project in Switzerland to achieve LEED Platinum under LEED v4. Speaking on this achievement, USGBC CEO Mahesh Ramanujam said that "LEED v4 was designed to be the most rigorous green building rating system in the world...Olympic House's LEED Platinum certification demonstrates tremendous green building leadership and sets the IOC apart as a leader in sustainability in the international sports world" (olympic.org).

Much of this leadership shone through in the innovations surrounding circular economy, user wellness, and resource efficiency. Through these initiatives, the Olympic House was able to fulfill LEED regional priority credits such as Rainwater Management and Optimized Energy Performance. In addition to these sustainable strategies, the project team made substantial impacts in several other areas. For example, the IOC was intent on making sure that the materials they used were ethically sourced. To this end, wooden products in the Olympic House are certified by the Forest Stewardship Council, fulfilling LEED credit Building Product and Optimization: Sourcing of raw materials. This certification requires that wood be derived from forests that are managed in a way that promotes long-term health and quality of forest ecosystems. Additionally, the certification ensures that there is special attention given to enhancing the social and economic well-being of workers and local communities.

The Olympic House is also constructed to ensure that both the site and the local Swiss ecosystem are kept in as pristine condition as possible. To this end, the IOC decided to build the Olympic House on a brownfield. This brownfield, a LEED-designated High Priority Site, was remediated prior to construction, with depollution practices used to restore the soil to an ecologically stable status. The choice of site also opened up opportunities for employees to commute via alternative transportation. 135 bicycle parking spaces have been installed on the grounds of the Olympic House, encouraging commuters to eschew car travel in favor of a healthy, carbon free option. Additionally, chargers for electric cars were added to the parking and a pay per use system was implemented for the use of car spaces.

Over 60% of the IOC's property is open space, half of which is vegetated. This vegetation is mostly indigenous plants, including pollinating plants that encourage interactions with local fauna. In addition to this foliated space, 2,500 square meters of the Olympic House's roof is vegetated, decreasing the heat island effect and improving the surrounding ecosystem. Finally, the Olympic House's carbon emissions from construction and operations are compensated through an IOC-DOW carbon mitigation program.

Exterior of the Olympic House with landscaped terraces and views of Lake Geneva (Photo credit: IOC)

Access the IOC Sustainability Strategy and Report at www.olympic.org/sustainability

"Sustainability was one of the project's five success factors from the outset. This requirement was given further weight when Olympic Agenda 2020, the IOC's strategic roadmap, was adopted in late 2014, which was when we were choosing our architects. We needed to lead by example and back up our words with action."

- Marie Sallois, IOC Director of Corporate Development, Brand and Sustainability

Looking Towards the Future

The IOC hopes that the Olympic House will be an example for all LEED projects to come. As the highest scoring LEED v4 certified new construction project to date, Olympic House represents a model example of how to handle a large-scale LEED project. The Olympic House did not emerge out of nothing. It was the concerted effort of large amounts of professionals coordinating over several years. The building demonstrates that the path to sustainability is not necessarily the easy route. Creating a high-performing LEED building necessitates high levels of both innovation and collaboration. However, it is wholly possible to create a building that improves upon its surrounding environment and creates a happy healthy space for occupants. As the building enters its first few years of operation, close monitoring will be used to ensure that ecological benefits continue, and that leakage is kept to a minimum in all categories. As USGBC CEO Mahesh Ramanujam says, "LEED v4 is encouraging project teams to operate beyond the status quo" (olympic.org). The Olympic House stands as a paradigm of excellence in its field, and will likely be looked to as a successful example by future LEED v4 projects.

The Olympic House project is one example of how the IOC is implementing its Sustainability Strategy. Developed in line with the recommendations of Olympic Agenda 2020, the strategy focuses on five key areas: natural sites, sourcing and resource management, mobility, workforce and climate and covers the IOC's work across its three 'spheres of responsibility' – as an organization, as the owner of the Olympic Games and as the leader of the Olympic Movement. Published in October 2018, the IOC Sustainability Report tracks progress towards achieving the IOC's 18 sustainability objectives for 2020.

Upon completion in early 2019, the Olympic House received the most points out of any LEED v4 Building Design and Construction project to date.

In addition, Olympic House has also received Swiss Sustainable Construction Standard (SNBS) at the Platinum level and Minergie-P, the Swiss standard for energy-efficient buildings.

USGBC President/CEO Mahesh Ramanujam presents the LEED plaque at the Olympic House opening ceremony. (Photo credit: IOC/Greg Martin)

Olympic House

LEED BD+C: New Construction (v4) — **PLATINUM, AWARDED JUN 2019**

SUSTAINABLE SITES		AWARDED: 10 / 10
Prereq	Construction activity pollution prevention	0 / 0
Credit	Site assessment	1 / 1
Credit	Site development - protect or restore habitat	2 / 2
Credit	Open space	1 / 1
Credit	Rainwater Mgmt	3 / 3
Credit	Heat island reduction	2 / 2
Credit	Light pollution reduction	1 / 1

WATER EFFICIENCY		AWARDED: 11 / 11
Prereq	Outdoor water use reduction	0 / 0
Prereq	Indoor water use reduction	0 / 0
Prereq	Building-level water metering	0 / 0
Credit	Cooling tower water use	2 / 2
Credit	Water metering	1 / 1
Credit	Outdoor water use reduction	2 / 2
Credit	Indoor water use reduction	6 / 6

ENERGY & ATMOSPHERE		AWARDED: 31 / 33
Prereq	Fundamental commissioning and verification	0 / 0
Prereq	Minimum energy performance	0 / 0
Prereq	Building-level energy metering	0 / 0
Prereq	Fundamental refrigerant Mgmt	0 / 0
Credit	Enhanced commissioning	6 / 6
Credit	Advanced energy metering	1 / 1
Credit	Demand response	0 / 2
Credit	Renewable energy production	3 / 3
Credit	Enhanced refrigerant Mgmt	1 / 1
Credit	Green power and carbon offsets	2 / 2
Credit	Optimize energy performance	18 / 18

MATERIAL & RESOURCES		AWARDED: 8 / 13
Prereq	Storage and collection of recyclables	0 / 0
Prereq	Construction and demolition waste Mgmt planning	0 / 0
Credit	Building life-cycle impact reduction	3 / 5
Credit	Building product disclosure and optimization - environmental product declarations	1 / 2
Credit	Building product disclosure and optimization - sourcing of raw materials	1 / 2
Credit	Building product disclosure and optimization - material ingredients	1 / 2

MATERIAL & RESOURCES		CONTINUED
Credit	Construction and demolition waste Mgmt	2 / 2

INDOOR ENVIRONMENTAL QUALITY		AWARDED: 8 / 16
Prereq	Minimum IAQ performance	0 / 0
Prereq	Environmental tobacco smoke control	0 / 0
Credit	Enhanced IAQ strategies	1 / 2
Credit	Low-emitting materials	3 / 3
Credit	Construction IAQ Mgmt plan	1 / 1
Credit	IAQ assessment	0 / 2
Credit	Thermal comfort	0 / 1
Credit	Interior lighting	2 / 2
Credit	Daylight	0 / 3
Credit	Quality views	1 / 1
Credit	Acoustic performance	0 / 1

REGIONAL PRIORITY		AWARDED: 4 / 4
Credit	Optimize energy performance	1 / 1
Credit	Thermal comfort	0 / 1
Credit	Sensitive land protection	1 / 1
Credit	Site development - protect or restore habitat	1 / 1
Credit	Rainwater Mgmt	1 / 1
Credit	Light pollution reduction	0 / 1

LOCATION & TRANSPORTATION		AWARDED: 14 / 16
Credit	LEED for Neighborhood Development location	0 / 16
Credit	Sensitive land protection	1 / 1
Credit	High priority site	2 / 2
Credit	Surrounding density and diverse uses	4 / 5
Credit	Access to quality transit	4 / 5
Credit	Bicycle facilities	1 / 1
Credit	Reduced parking footprint	1 / 1
Credit	Green vehicles	1 / 1

INTEGRATIVE PROCESS CREDITS		AWARDED: 1 / 1
Credit	Integrative process	1 / 1

TOTAL	93 / 110

Learn More

Olympic House	https://www.olympic.org/olympic-house
International Olympic Committee	https://www.olympic.org/the-ioc
IOC Sustainability	https://www.olympic.org/sustainability
LEED	https://new.usgbc.org/leed

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