ARE YOU ENLIGHTENED?

Christmas Lights –

Power Consumption and Light Pollution in Vienna

Research Paper / Stories4Change

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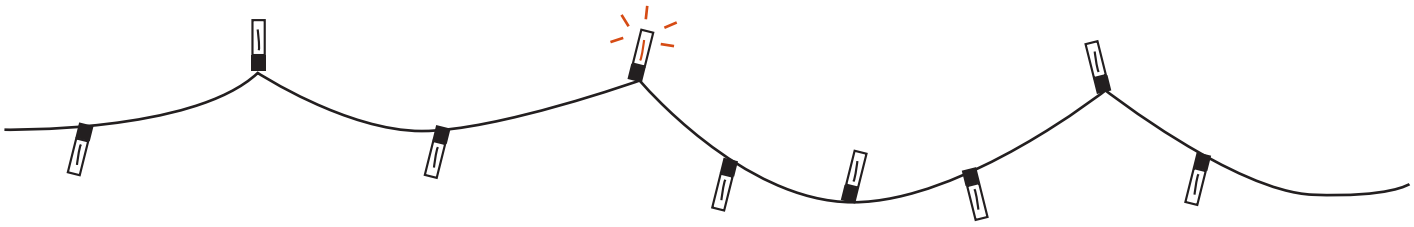

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Power consumption and light pollution in Vienna

The phenomenon of light pollution describes the brightening of the night sky by artificial light. Having negative effects on flora, fauna as well as human health and therefore impacting the quality of life, it poses a global challenge that is subject to interdisciplinary research (Schulte-Römer 2019). Especially considering light emitting installations in urban spaces, the causes of light pollution range from street lightning, the illumination of monuments and buildings over business lightning to light sources from private buildings (Stadt Wien 2016).

Here, the Green Party of Vienna warns that additional lighting in streets, facades as much as lightning decoration within the garden pose increased effects on the day-night rhythm of human beings, while influencing living conditions of a variety of animal and plant species. This further impacts orientation, communication as much as their reproductive, feeding and sleeping behavior (Baron 2018).

Not only affecting birds and insects as much as light-sensitive flowers and trees, fairy lights, shining snowmen, twinkling stars, ect. consume within a few weeks around christmas more than 10,000 Austrian households do in a whole year. Hence, during the Christmas Holidays a Viennese household on average consumes about 10 kWh more electricity per day, which represents twice as much as on comparable days in winter (ORF 2019). 3 Million households in Austria receive a plus of more than 90 million kWh only for those days, that results, next to increased use of cooking facilities and consumer electronics, of the vast application of christmas lights (Grohs 2020). In current media and journals this phenomenon further is described as “holiday effect” (*Feiertagseffekt*). Contrary, in 2017 Wien Energie (DIYBook 2019) describes a decline in total power consumption on the 24th, 25th and 26th december. By representing holidays in Vienna, this however is attributed to the fact that stores and most companies and businesses are closed and therefore do not require lightening or heating, which normally takes a strong percentage of power consumption in Vienna. Therefore, this is disconnected from an investigation on private consumption as much as public lighting in streets.

In particular, Viennese shopping streets are covered with 200 km cable and 2 million light points. Hence, since 2010 4.3 million euros are annually invested in sparkling christmas lights in Vienna. Including five Viennese shopping streets as well as 33 new projects, a crystal chandelier among them, huge amounts of money go hand in hand with power consumption.
Here, the Energy Saving Association of Upper Austria further warns that long-lasting inefficient fairy lights do increase personal electricity costs substantially and further result in the fact that individuals, businesses and communities infame millions of euros. After all, so-called “islands of light” (*Lichtinseln*) within Westbahnstraße, are powered with energy through solar panels and photovoltaic installations during the day time (APA 2010).

Finding a Solution

Covering most of the street lightning at christmas time in Vienna, currently LEDs, that are 80% more efficient, spark from 4 pm to 10 pm (WKO 2020).

The Eco Council of the city Vienna strongly advises the usage of LED lights instead of other electricity implementations, due to their more efficient energy use. Especially considering sparkling decoration at christmas time, next to a variety of energy institutions, Wien Energy (*Wien Energie*) as well stress a shift from conventional lightning (eg. light bulbs) to LEDs.
Next to their higher efficiency and long-lasting quality, that especially finds application in street lightning, as much as outlined materialistic benefits, light quality and color reproduction, their dimmability characteristics are mentioned as advantage in particular considering christmas lightening. This, together with their flicker free rays and color temperature, further is said to reduce the impact on the natural environment (Wien Energie 2017). Especially online media as well as various newspaper articles outline their pride on "power savings" and "environmental friendliness" by switching 30 of 35 light installations in shopping streets to LED lighting.

Although 2014 most of the decorative lightning in Viennese streets at wintry holiday season had been transformed to LEDs, environmental institution further describes an increased probability of a so called “rebound effect”, which causes eg. increased consumption and application due to the variety of described advantages, that, in the long-run pays off the benefits again.
Nevertheless, Schulte-Römer et al. (2019) found, that due to their blue rich color temperature, brightness increase and cheap implementation as well as inefficient application, installation and illumination design of LEDs, they further do not represent a sustainable energy-efficient solution (*Ibid*. 5).
Further Bernhard Gruber (WKO) addresses the phenomenon that those 80% of energy efficiency are compensated due to a switch on figurine and theme, happening every five to ten years, as people desire new and unique motives (Wimmer 2014).

As a fairy light (35 lights, 3 W/light, 8 hours use) exceed power consumption of a conventional fridge, the capacity of the lights is crucial to consider. Hence, relevant selection of lightning material can reduce power usage about 80% (Öhrlinger 2017).

Further, energy institutions (eg. Wien Energie, APA, …) recommend the application of a timer, in order to reduce the times of lightning to the shortest possible time and prevents oblivion on turn offs. Here, to maintain a good night's sleep as well as the quality of life of human and non-human species like animals or plants, recommendations go towards a shut down after 10 pm. Further, a removal of the assembly or complete unplugging and switch-off is strongly advised to happen sharp after the holiday season, latest within the new year.
Additionally, environmental organizations state candles and lanterns as an alternative to electric lightning, together with further calls towards a reduction to the lowest possible amount of lightening elements (Baron 2020).

Additionally, education of the public, as well as the teaching and informing in, of and through educational institutions, schools, ect. is viewed as an act towards a solution (APA 2010).

Stories4Change - Video Realization

Hence, common knowledge and awareness on the needs of these issues, stressed by several environmental agencies, represent the driving force behind the visualization and realization of this video. Due to the picture selection, speed, sound and increased acceleration and hectics, individual awareness and reflection, especially on important characteristics of silence and rest, is stimulated. Further, core themes of christmas time in Austria, like necessity, well-being, quality of life, and cosiness are addressed an object of personal re-thinking processes. Hence, a commercialized mediation style aims to catch the public's interest and, during the course of the video, strives the results of reflection as much as personal change in action.

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