**Paper: An Analysis of Peak Demand Reduction Due to Elasticity of Domestic Appliance**

**Reviewer: Ye Xu**

**A SHORT SUMMARY OF THE PAPER:**

This paper mainly presents the following aspects:

1. This paper studies the potential reduction in peak power to carry out demand by modifying the elastic load components of common household appliances. By increasing the duration of operation time, which the author believes there is no impact on the appliance’s life time, this component could decrease its instantaneous power draw.
2. This paper also quantifies how the potential reduction in aggregating peak power can be related to the duration required to complete the operation of the appliances. The author of the paper claimed that in four geographic regions: Ontario, Quebec, France and India, peak demand can be reduced in a huge amount during winter and summer.
3. The paper also gave a couple of notions of the appliance elasticity. The author defined an optimization program that the appliance can load during its demand peaks without overly affecting user comfort.
4. Finally, the paper gave comprehensive experimental results and data to evaluate the benefits from their approach.

**STRENTH AND CONTRIBUTIONS OF THE PAPER:**

This paper has three key contributions:

1. The penetration rate of 10 common appliances in the four regions was considered in the paper. This consideration helps get more accurate result of reduction rate.
2. The usage pattern and detailed load profiles are also considered. With these a simulation with more realistic set-up can take place.
3. The author of the paper also discussed the potential negative impact on the appliance due to the reduction in peak power and extension of the operation duration, which gave us a reasonable argument that everything has a tradeoff.

In general, the structure of the paper was clear; the overall technical explanations were easy to understand. However, the paper seems to be unclear regarding to certain details of the technical part. Also, the novelty in terms of research seems to be weak, as would be discussed below.

**WEAKNESS OF THE PAPER:**

1. The paper focused on the residential home cases, but it failed to show how much percentage of the power was used and the relationship between home and industry. For instance, if the power usage at home compared to industry has a significant lower percentage, which in my view should be true, then the peak power reduction in home is not that as significant as the paper claims.
2. The paper showed different simulation results in the four regions from different countries. But it did not give deeper discussion or advice how to deal with these differences what so ever. The readers would like to know how to take care of these differences to optimize peak power reduction. Since the power usage patterns in these four regions are different, it might be difficult to generalize the optimized peak reduction.
3. The author did not consider the cost-benefit analysis in the paper. After all, as a home consumer, one should almost always care about the cost bill the most. This analysis is very common in other relative work, and should also have been appeared in this paper.

In conclusion, this paper aimed to solve a practical problem in recent hot topic of “green” buildings. It provided a technique to reduce peak power by extending the operation duration, and showed some simulation results, which was further discussed and the tradeoffs also analyzed. The paper could have been improved if the author considered some of the practical issues, such as how to deal with the different power usage patterns in different areas of the world, and so forth.