

## IMPACT OF COVID-19 ON HOUSEHOLD POWER CONSUMPTION AND DEMAND

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### Abstract:

*This paper aims to study and overview the impacts and challenges of the COVID-19 pandemic on household power consumption or utilization and its demand. It's required to understand how the COVID-19 pandemic has been altered not only everyone's life but also many business areas, financial sectors and household regions as well. To stop COVID-19, the performed actions made major impacts on daily life all around the world wide. On that note in terms of efforts, self and government of countries implies some restrictions on limiting travelling, social interaction, in-person working, declines commercial, household, and industrial operations. During the pandemic as well as in the covid recovering areas the change in the life is completely shifted that where to use electricity, when to use and up to how to use the power. In response to reduce the virus of COVID-19 the governments of all around the world were forced to minimize the business activities. Due to the COVID-19 pandemic, the requirement for electricity demand is significantly reduced in industry.[1] The COVID-19 virus makes the lifestyle changes almost all around the world. As it is possible to do work from home, to avoid direct physical contact or to make social distancing. So that significant change arrives in the electric sector, the power consumption makes remarkable increase in a residential area while there is a substantial decline in commercial as well as industrial loads. This destructive situation builds new provocation in the technical, commercial, educational, and financial activities of the electricity sectors. A huge rise in electricity has arrived in the household area because all the work is done from home. [2] In household power consumption the amount of electrical power is expanded, which may induce more power utilization and enlarge its demand. Every region of the world is affected due to COVID-19 crises, whereas the household area gets more affected as it makes changes in the lifestyle.*

**Key words:** COVID-19, lockdown, electricity, power consumption, social distancing, household, electronic devices.

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### Introduction

The coronavirus disease 2019 (COVID-19) has been swiping the world very badly , By Mid-December 2020, approaching 75 M confirmed cases of COVID-19 and over 1.7 M deaths in almost 220 countries had been reported to the World Health Organization. [3] Suggested that the COVID-19 pandemic might get more deadly

than the most severe pandemic in the last century. Many measures such as quarantine, social distancing, and lockdown have been set to mitigate the coronavirus infection. [4] The COVID-19 pandemic has caused profound influences for many industries, including agriculture, manufacturing, finance, education, healthcare, sports, tourism, and food. [5]

Coronavirus is a type of virus that causes specifically a disease called COVID-19. [6] This disease is mainly caused to mammalians. This virus makes serious cause in a human being, which may lead to death in some cases. Most probably this virus is going to be spread via Air. People can cause COVID-19 disease when the people breathe in the air, which is infected by covid contaminated droplets. Also, covid can cause due to physical interaction like touch, coughing, sneezing. So, to stop transmission there is a need to stop direct contact with people. All over the world, the government of various nations defines some rules and regulations, on how to behave in COVID-19 pandemic situations or how to protect ourself from dangerous COVID-19 disease.

The protocols are required to take the step to protect yourself and others too. This protocol mainly suggests social distancing, which may lead to stop social gathering. All the industry, education, household, transport, financial sectors, business, social areas get disturbed. The effect of COVID-19 can cause serious effects on people's daily lifestyle, nation's economy, and many more.

But the humans are born to survive. We have to admit that Covid makes various damages that are loss of life due to lack of medication to fight against coronavirus, loss of jobs, loss of money by means of loss to the economy.[7] It also disturbed students' life in terms of education, affecting the mental health of the nation due to depression and stress situations, which arrive due to dangerous COVID-19 virus. Covid can't stop human beings to survive in the toughest situations, as it's not possible to do work in social space or by offline mode. But humans applied their daily work in online manner.

In that case the technology comes into the picture, which includes various video conferencing platforms to make communication. Use of internet services, electronic devices like laptops, smartphones, PC, smart devices, etc. get enhanced. In the COVID-19 pandemic situation, people are not allowed to go to offices, workplaces, schools, colleges, or in the area which violates government protocols. In that case peoples are restricted to complete their work from home only, via online mode itself. The online mode of working leads to additional use of technology and required electronic devices in day-to-day life as the peoples are working from their homes. Electronic devices required electric energy. Electric energy consumption or its utilization is the one type of energy consumption which uses electric energy. Electric power consumption is the genuine energy demand, which is made on existing electricity supply in various categories like transport, household use, industrial purpose, commercial, and also for other requirements.

Due to work from home and the lockdown which was declared by the government of India [8] the use of home appliances such as television, washing machines, refrigerator, AC, oven, microwave, water heater, mixer get enlarged.[9] The domiciliary use of electronic products or hand-held devices in the household area is increased.

Before COVID-19 situations household electronic devices are in use but in the pandemic, the overuse of household electronic devices has been arrived. The overuse of electronic devices in the household area makes an increase in the rate of power consumption and its demand as well.[10]

### Objective

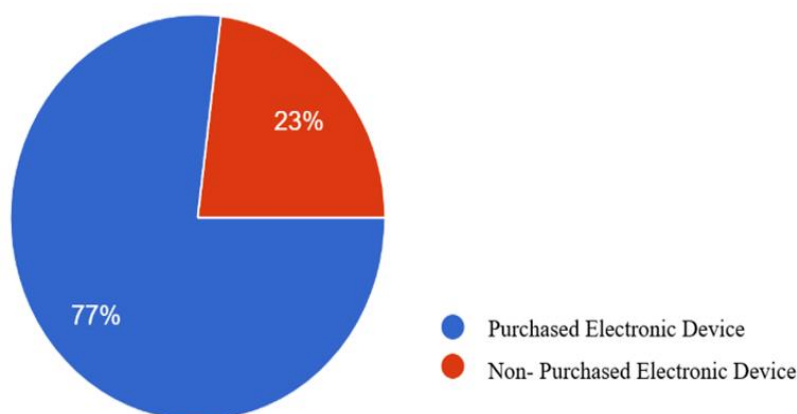
1. To study power consumption in the household area during the COVID-19 pandemic.
2. To overview the impact of COVID-19 pandemic on-demand or requirement of electricity.
3. To compare the power consumption and its demand before COVID-19 and within the period of COVID-19.
4. To study how the COVID-19 affects the overall electricity sectors in household regions.
5. To check whether the number of differences occurred in the electricity bill of power consumers.
6. To study whether the consumers are able to purchase energy-efficient electronic products during the COVID-19 pandemic.
7. To analyse the purchase rate of electronic devices in a pandemic.
8. To analyse the overcharged use of electronic devices in COVID-19.

### Methodology

This data is collected from a household individual by the survey of power consumption and its demand during the time of COVID-19 pandemic to analyse the amount of electricity usage in the household area. This survey data is collected from the approximately 150 common peoples of Maharashtra who faced the COVID-19 pandemic and make the use of technology or electronic devices in the period of the COVID-19 pandemic.

### Data Analysis and Result Presentation

#### I. Purchase rate of an electronic device in COVID-19 pandemic.

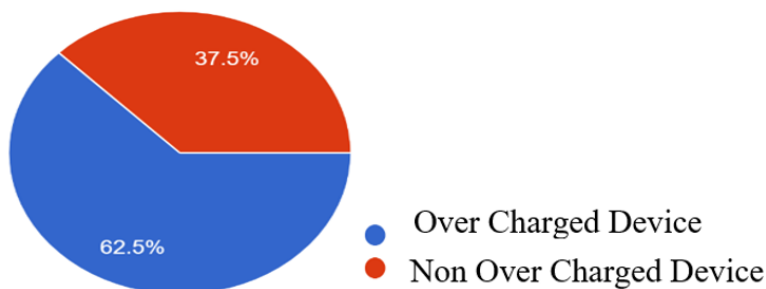


**Fig: 01**

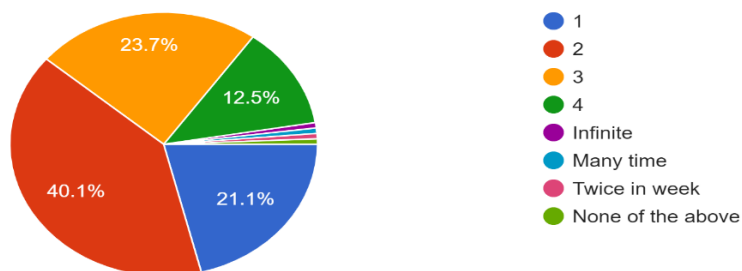
Above Fig: 01 shows the actual rate of purchased electronic devices in the COVID-19 pandemic. The graphical representation includes the purchased and non-purchased electronic devices, which shows that 77%



**IV. Analysis of overcharged requirement of electronic products in COVID-19.**



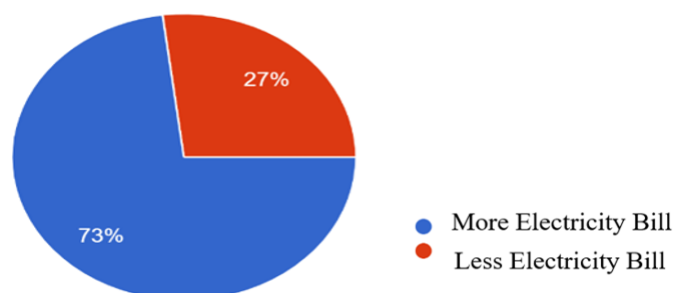
**Fig: 04**



**Fig: 05**

Fig 04 shows that in the pandemic time around 62.5% of the population defines that they have consumed more power than their average use in the household area. The significant number is quite larger who make greater utilization of electricity which indicates the high demand of electricity in household area. Fig: 05 represents the number of times the people charged their devices. Which is quite high in number which may lead to high power consumption.

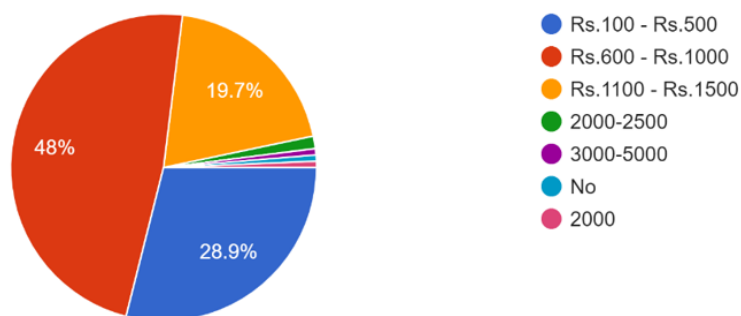
**V. Rate of electricity bill in covid time vs rather than daily life consumption bill**



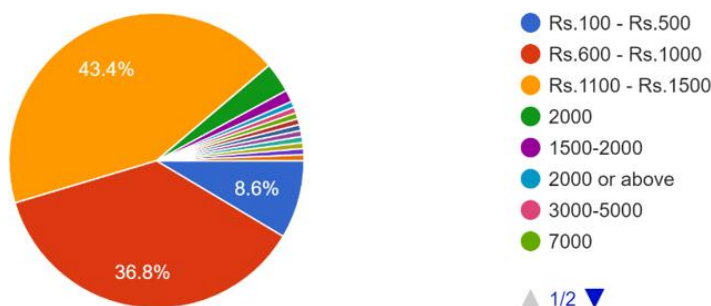
**Fig : 06**

As Fig: 04 shows high power consumption in the household, Fig: 06 conveys that the amount of electricity bill also gets high in numbers. Almost 73% of mankind realized an additional number of hikes in the electricity bill.

**VI. Analysis of power consumption bill amount before COVID-19 and within COVID-19 situations.**



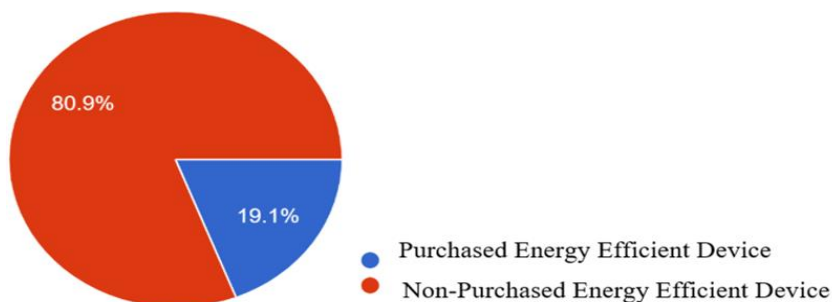
**Fig: 07**



**Fig : 08**

Fig: 07 represents the electricity bill amount before the covid-19 pandemic and the fig : 08 shows the amount of electricity bill within the covid-19 pandemic situations. From both the figures we can analyse that the bill amount gets increased in the covid-19 period due to high level of power consumption in the household region.

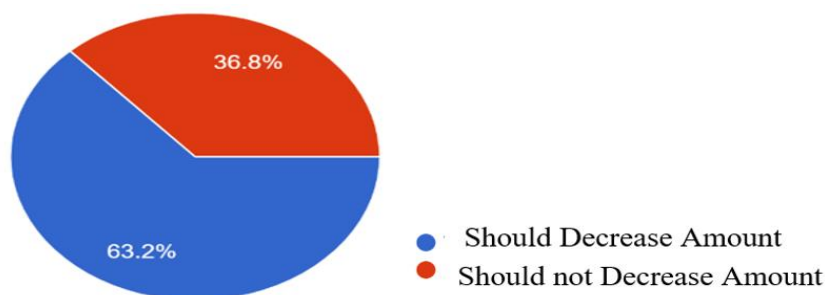
**VII. Analysis of the purchased rate of energy-efficient devices in COVID-19.**



**Fig: 09**

In the COVID-19 pandemic Fig: 09 indicates that people are unable to buy energy-efficient electronic products. From the overall survey around 80.9% of peoples are not purchased energy-efficient devices to save power energy in household areas.

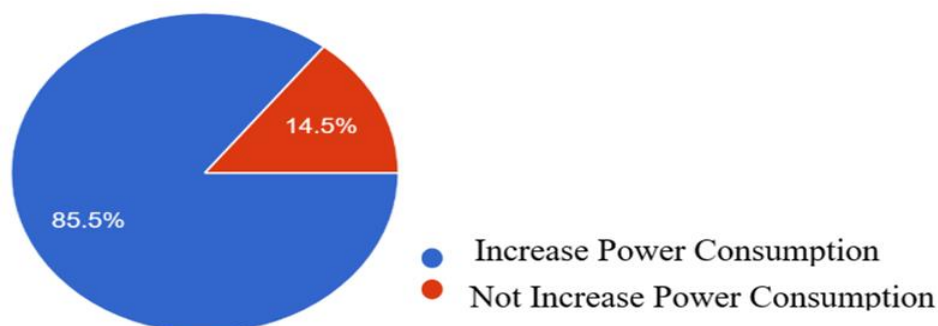
**VIII. To examine mankind opinion on the amount of per kilowatt should decrease in the COVID-19 pandemic.**



**Fig: 10**

Fig: 10 reveals around 63.2% of household mankind suggested that in covid-19 pandemic the amount of per kilowatt should decrease as there is more power consumption and demand arise which is conclude in fig: 04.

**IX. Analysis of Online mode of Education, Shopping, Payment, Work from home, etc. should increase the power consumption in COVID-19 Pandemic.**



**Fig : 11**

Fig: 11 indicates that around 85.5% of the audience admitted that online mode of work increased the rate of electricity consumption at the time of pandemic in a household.

**Conclusion**

From the above data analysis and result representation, we can conclude that the Purchase rate of electronic devices are increased, again from overall COVID-19 situation are responsible for online the mode of work in the household region, which obviously may lead to an increase in the use of electric power and its demand in the area of the household. As demand arises, high power consumption made a drastic consequence in terms of household finance, as they are expected to pay a high amount of bill.



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