# INTRODUCTION :-

## Overview :-

A brief description about your project

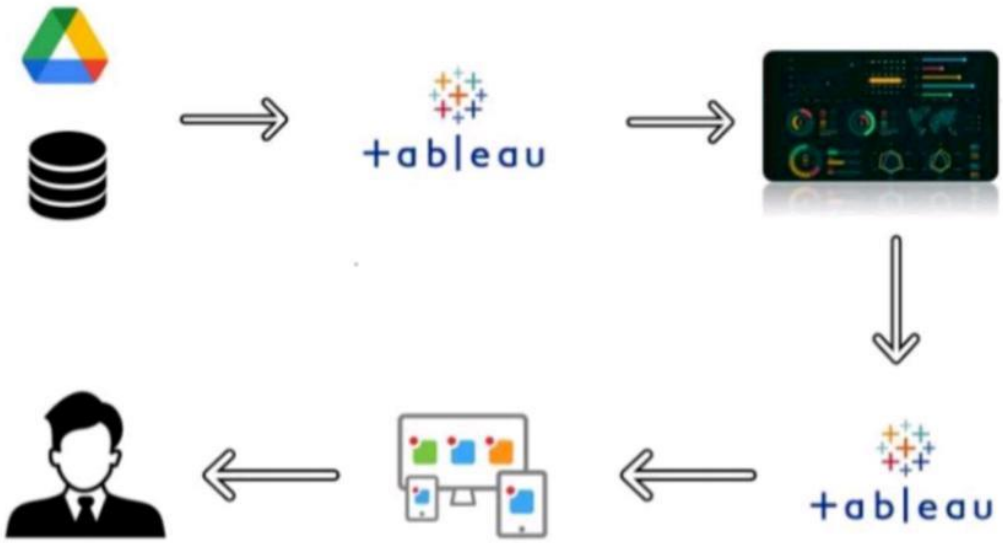
## Purpose ; -

The use of this project. What can be achieved using this

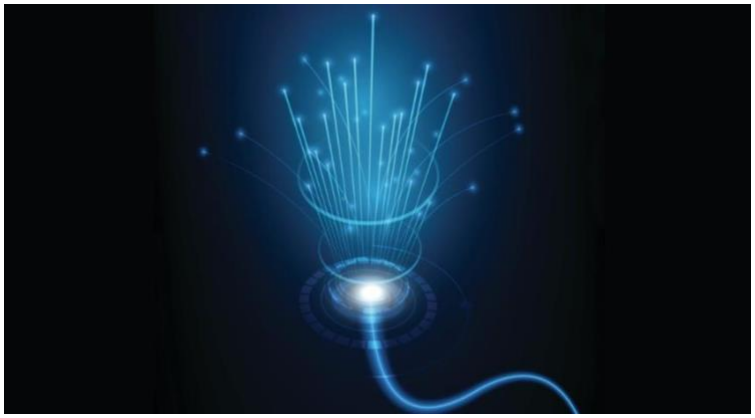
## Electricity Consumption : -

**Global electricity consumption has continued to go up rapidly at a rate faster than energy consumption. Between 1980 and 2013, the world's annual electricity consumption rose from 7300 TWh to 22,100 TWh. Since the twenty first century, global electricity consumption has seen even faster growth, as evidenced by an average annual increase of 3.4%, 1.2 percentage points higher than average annual growth of energy consumption.**

Electric power consumption measures the production of power plants and combined heat and power plants less



transmission, distribution, and transformation losses and own use by heat and power plants.



Whereas electricity consumption represents the amount of electrical energy that has been consumed over a specific time, in units of Wh (or kWh), electricity demand represents that rate at which electrical energy is consumed for a needed output rating, in units of W (or kW).

In physics, electric power measures the rate of electrical energy transfer by an electric circuit per unit of time. Denoted by P and measured using the SI unit of power which is watt or one joule per second.

Heating and cooling are by far the greatest energy users in the home, making up around 40% of your electric bill. Other big users are

**washers, dryers, ovens, and stoves. Electronic devices like laptops and TVs are usually pretty cheap to run, but of course, it can all add up.**

## Exploration of the power consumption of storage systems based on NAND flash memory through measurements : -

**Power consumption metrics measurements can be performed for an exploratory purpose, in order to understand and to study the power consumption profiles of the storage system or of one of its components. Besides, power consumption measurements can also be performed during a study in order to validate the precision of a power**

**consumption model, or to measure the efficacy of a proposition of a new storage system or an optimization that targets energy saving. Here we concentrate on the studies that deal with the exploration of storage systems' power consumption based on flash memory as their main subject.As flash memory is a relatively recent technology, numerous studies illustrate sequences of power consumption measurements that target this kind of memory. Their goal is to characterize the power consumption profiles of these systems.**

**Moreover, some studies further develop this work by analyzing the measurements in order to identify the elements which have a significant impact on power consumption and the elements which, on the contrary, have a negligible impact. Highlighting these elements is a first, essential step in any work for optimizing performance or consumption.**

**The measurements can be performed at flash chip level [GRU 09, MAT 09]. In this case, a specific hardware platform is required where the flash chip can be inserted and equipped for power consumption measurement. This kind of platform was built by the authors of the two cited studies, and it includes a resistor along the power supply rail of the chip. By means of an oscilloscope, the current at the resistor's terminals is measured. The oscilloscope has to provide a data logger function in order to be able to exploit the data at a later time. This method of equipping the power supply line with a measuring device is also employed in many studies that address the power consumption of SSDs [SEO 08, SHI 10, BJØ 10, YOO 11a], and the comparison between the power consumption of SSDs and hard**

**disk drives [DAV 10, LEE 09b,**

## PURPOSE ; -

- **The residential sector includes homes and apartments.**
- **The commercial sector includes offices, malls, stores, schools, hospitals, hotels, warehouses, restaurants, and places of worship and public assembly.**
- **The industrial sector includes facilities and equipment used for manufacturing, agriculture, mining, and construction.**
- **The transportation sector includes vehicles that transport people or goods, such as cars, trucks, buses, motorcycles, trains, aircraft, boats, barges, and ships.**

**These end-use sectors consume primary energy and also purchase and use most of the electricity (a secondary energy source) the electric power sector produces and sells. The electric power sector consumes primary energy to generate electricity for sale to the other four sectors and for export to Canada and Mexico. The end-use sectors also produce some electricity for their own use, which in the industrial and commercial sectors is called direct use.**

# Project Report Template

**1 INTRODUCTION**

1.1 Overview

A brief description about your project

1.2 Purpose

The use of this project. What can be achieved using this.

**2 Problem Definition & Design Thinking**

2.1 Empathy Map

Paste the empathy map screenshot

2.2 Ideation & Brainstorming Map

Paste the Ideation & brainstorming map screenshot

**3 RESULT**

Final findings (Output) of the project along with screenshots.

**4 ADVANTAGES & DISADVANTAGES**

List of advantages and disadvantages of the proposed solution

**5 APPLICATIONS**

The areas where this solution can be applied

**6 CONCLUSION**

Conclusion summarizing the entire work and findings.

**7 FUTURE SCOPE**

Enhancements that can be made in the future.

**8 APPENDIX**

A. Source Code

Attach the code for the solution built.

Template

# Empathy map

Use this framework to develop a deep, shared understanding and empathy for other people. An empathy map helps describe the aspects of a user's experience, needs and pain points, to quickly understand your users' experience and mindset.

## Build empathy

The information you add here
observations and research yo

**Says**

What have we heard them say?
What can we magine them saying?

Electricity can transform people's lives,not just economically but also socially

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Benjamin Franklin is credited for discovering Electricity in the 1700s.....

Entertainment

Hou

engineering

**Does**

What behavior have we observed?
What can we imagine them doing?

## Build empathy

The information you add here should be representative of the observations and research you've done about your users.

**Says**
What have we heard them say?
What can we magine them saying?

Electricity can transform people's lives,not just economically but also socially

Electricity is really just organized Lightning!....

Talent is like electricity, we don't understand electricity ,we use it

Benjamin Franklin is credited for discovering Electricity in the 1700s.....

**Thinks**
What are their wants, needs, hopes, and dreams? What other thoughts might influence their behavior?

Does it provide safety ?,...

To know that we can make electricity in different ways...

Does it helps to improve Economy ?,...

IF you have a idea light it up OR forever remain in the dark

To begin to understand how the way we get electricity can affect our environment...

EXPLORATION OF ELECTRICITY !..

Entertainment

Household

engineering

commercial

Sometimes messes up with wildlife,...

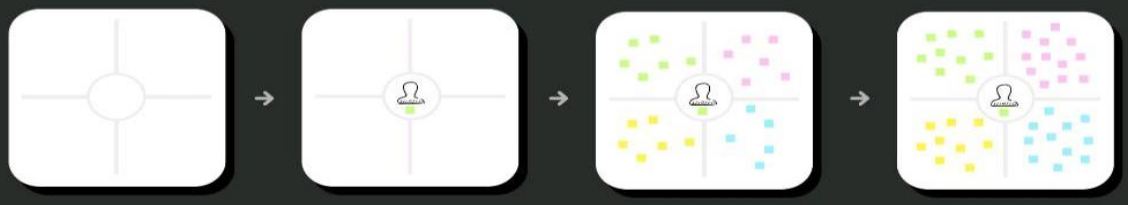
Excess of electrons

Dependent on precipitation...

more expensive than gasoline

**Does**
What behavior have we observed?
What can we imagine them doing?

**Feels**
What are their fears, frustrations, and anxieties? What other feelings might influence their behavior?



Template

# Brainstorm & idea prioritization

Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room.

**10 minutes** to prepare
**1 hour** to collaborate
**2-8 people** recommended

Share template feedback

## Before you collaborate

A little bit of preparation goes a long way with this session. Here's what you need to do to get going.

10 minutes

A **Team gathering**
Define who should participate in the session and send an invite. Share relevant information or pre-work ahead.

B **Set the goal**
Think about the problem you'll be focusing on solving in the brainstorming session.

C **Learn how to use the facilitation tools**
Use the Facilitation Superpowers to run a happy and productive session.

Open article →

**Need some inspiration?**
See a finished version of this template to kickstart your work.

Open exa

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Open article →

1

Defin

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1

## Define your problem statement

What problem are you trying to solve? Frame your problem as a How Might We statement. This will be the focus of your brainstorm.

5 minutes

Plugging into the future ; An exploration of Electricity consumption patters .....
The environment problems directly related to energy production and consumption include air pollution,climate change,water pollution,thermal pollution, and solid waste disposal.The emmision of air pollutants from fossil fuel combustion is the major cause of urban air pollution

### Key rules of brainstorming

To run an smooth and productive session

- Stay in topic.
- Defer judgment.
- Go for volume.
- Encourage wild ideas.
- Listen to others.
- If possible, be visual.

2

## Brain

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that ad

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Person 1

Wet hands electric shock cartoon

wet hand touch electricity cause dander

electrical outlet wiring

Person 5

battery

motherboard

electric vehicle

2

## Brainstorm

Write down any ideas that come to mind that address your problem statement.

10 minutes

**TIP**

You can select a sticky note and hit the pencil [switch to sketch] icon to start drawing!

**Person 1**

| | | |
|---|---|---|
| Wet hands electric shock cartoon | power do your electronic | the danger of plugging in electricity |
| wet hand touch electricity cause danger | plastic power plug switch board | Does leaving a plug in use |
| electrical outlet wiring | home and garden | electrical plugs |

**Person 2**

| | | |
|---|---|---|
| energy storage system | local transaction | need to improve resilience of distribution |
| loss of fish species | change in river | cost of construction |
| used in industrial fields | new electronics in power electronics | connection size depends on area |

**Person 3**

| | | |
|---|---|---|
| electric power saving | very important | home product useage |
| unit | alternate current | direct current |
| communication | office | digital worlds |

**Person 4**

| | | |
|---|---|---|
| data preparation | data visualization | dashboard |
| hydrogen bomb | solar | Hydrothermal |
| power office | transformer | intergrated system |

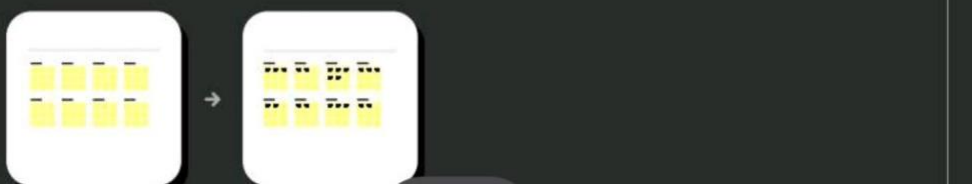
**Person 5**

| | | |
|---|---|---|
| battery | generator | signal |
| motherboard | internet | telephone |
| electric vehicle | capacitor | wi fi connection |

**Person 6**

**Person 7**

**Person 8**



3

## Group ideas

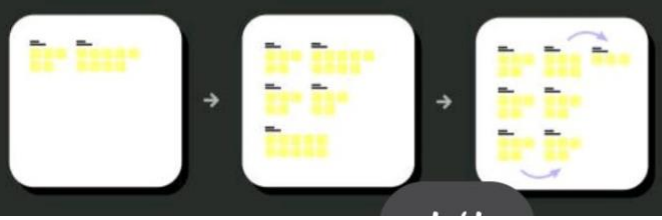
Take turns sharing your ideas while clustering similar or related notes as you go. Once all sticky notes have been grouped, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you and break it up into smaller sub-groups.

20 minutes

TIP

Add customizable tags to sticky notes to make it easier to find, browse, organize, and categorize important ideas as themes within your mural.

Electricity is an essential part of modern life and important to the u.s. economy .
*people use electricity for
1.lighting,
2. heating,
3.cooling ,and
4.refrigeratedand for operating appliances,computers ,electronics,machinery, and public transportation

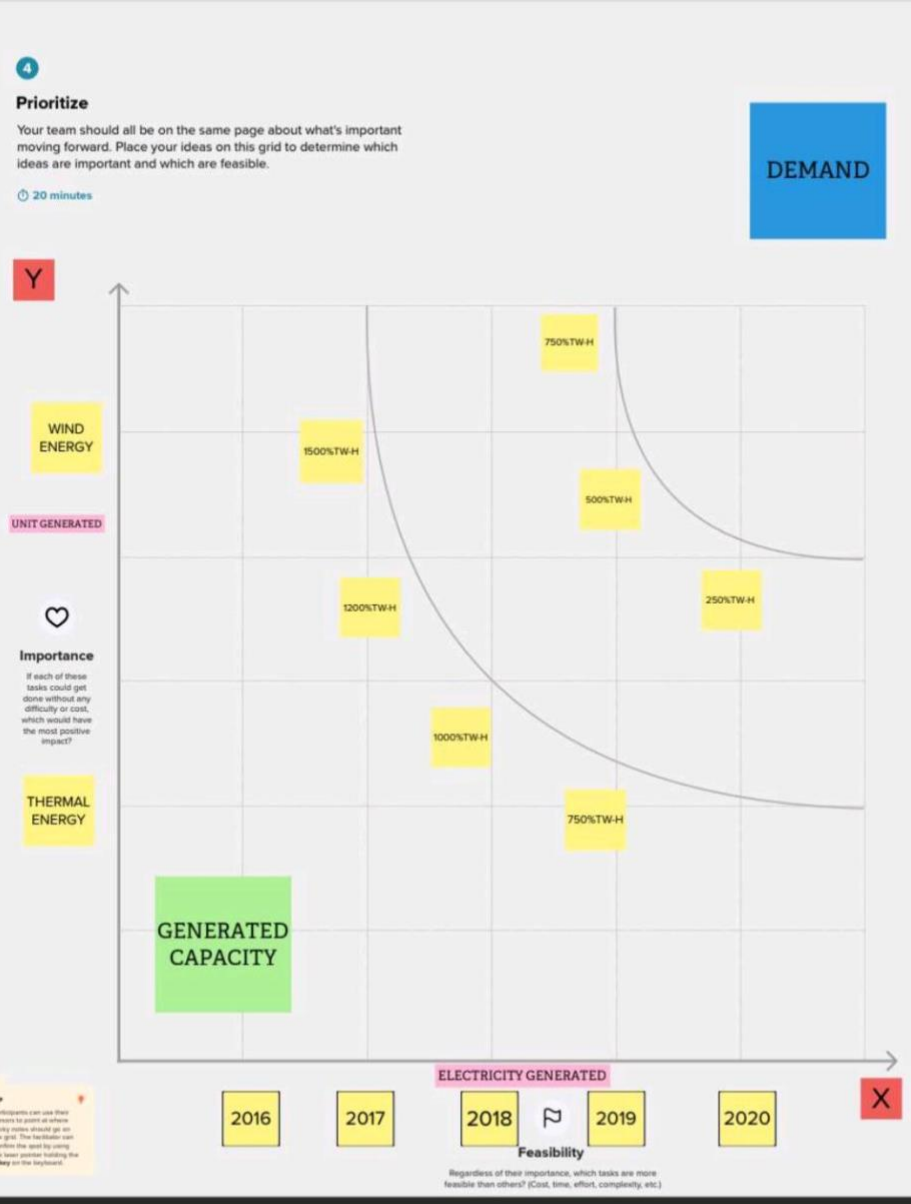


4

## Prioritize

Your team should all be on the same page about what's important moving forward. Place your ideas on this grid to determine which ideas are important and which are feasible.

20 minutes





## After you collaborate

You can export the mural as an image or pdf to share with members of your company who might find it helpful.

### Quick add-ons

A **Share the mural**
**Share a view link** to the mural with stakeholders to keep them in the loop about the outcomes of the session.

B **Export the mural**
Export a copy of the mural as a PNG or PDF to attach to emails, include in slides, or save in your drive.

### Keep moving forward

**Strategy blueprint**
Define the components of a new idea or strategy.
Open the template →

**Customer experience journey map**
Understand customer needs, motivations, and obstacles for an experience.
Open the template →

**Strengths, weaknesses, opportunities & threats**
Identify strengths, weaknesses, opportunities, and threats (SWOT) to develop a plan.
Open the template →

Share template feedback

# A BRIEF DISCRIPTION ABOUT ELECTRICITY CONSUMPTION :-

## Power Consumption

**The power consumption of IEEE 802.15.4 is determined by the current draw of the electrical circuits that implement the physical communication layer, and by the amount of time during which the radio is turned on. As shown in Chapter 11, there are several ways a radio can be switched off while maintaining communication abilities. Figure 12.10 shows the power consumption of the electrical circuitry of the CC2420 IEEE 802.15.4 transceiver, as reported by the CC2420 data sheet. It shows that the idle power consumption is significantly lower than both the listen and the transmit power consumption. In the idle mode, however, the transceiver is not able to receive any data. The power consumption in the transmit modes is lower than the power consumption in listen mode. The power consumption of the transmit mode depends on the output power, which is configurable via software on a per-packet basis.**

**Evaluation of Performance and Power Consumption of Storage Systems**

**Jalil Boukhobza, Pierre Olivier, in Flash Memory Integration, 2017**

## Advantages of electricity

### Consumption : -

- It is a clean, safe, cheap and convenient source of energy
- Lower maintenance cost
- More efficient
- No tailpipe emission
- We all know that it can be set up in many sizes
- It doesn't require as many employees
- Reduces greenhouse emission
- Makes barely any pollution compare to other ways of creating or
- generating electricity

- Relatively low maintenance cost
- Hydroelectric station are inexpensive to operate
- Hydroelectricity produces no gas emissions or waste
- A station can operate and run for long periods of time
- It is renewable

The application of Life Cycle Analysis (LCA) followed the methodological structure recommended by ISO 14044 (2006). Data were collected from the oil refinery's water supply system in the foreground inventory (gate to gate) and the ecoinvent database version 3.3 was used in the background inventory (cradle to gate) in Simapro software version 8.4.

**The impact assessment methods were Cumulated Energy Demand (CED) (Jungbluth and Frischknecht, 2010), Carbon Footprint (IPCC 2013 - 100 years) and Water Footprint (Boulay et al., 2017).**

**The water supply system is the conventional type, composed of surface water uptake, treatment, storage and distribution. The water uptake uses three sets of motor-pump with a flow rate of 700 $m^3$ $h^{-1}$ that pumps water to the Water Treatment Plant (WTP).**

**There are three water catchment points, Catu river (245 $m^3$ $h^{-1}$ or 35% of the total), Paraguacu river (175 $m^3$ $h^{-1}$ or 25% of the total) and Sao Paulo river (280 $m^3$ $h^{-1}$ or 40% of the total).**

**The electricity consumption of each set of motor-pump is 0.20 kWh $m^{-3}$ for Paraguacu river, 0.40 kWh $m^{-3}$ for Catu river and 0.07 kWh $m^{-3}$ for Sao Paulo river. In 2015 the total volume of water uptake was 6,117,984 $m^3$. The water supply system operates 24 h $dia^{-1}$.**

**The WTP is composed of flocculation, decantation and filtration processes. The distribution of water flows by gravity. The reference flow adopted was 1 $m^3$ of distributed water. In this way, the amount of auxiliary materials and electricity consumption of the water supply system are presented in**

**Electricity consumption and water losses were identified as the largest contributors to the impact categories considered in this study. Therefore, improvement scenarios together with scenarios of water uptake per source were analyzed in order to identify opportunities for environmental improvements. Seven additional scenarios were set for comparison with the Base Scenario.**

- **Inverter Scenario: considered the use of modern frequency inverters to reduce electricity consumption in uptake by 20%;**

- **Loss Scenario: considered the reduction of water losses in uptake to 5% and treatment to 20%;**

- **Combined Scenario: refers to the combination of Inverter Scenario and Loss Scenario;**

- **Paraguacu Scenario: considered water uptake only from Paraguacu river;**

- **Catu Scenario: considered water uptake only from Catu river;**

**•São Paulo Scenario: considered water uptake only from Sao Paulo river;**

**•São Paulo Combined Scenario: refers to the combination of Combined Scenario and Sao Paulo Scenario.**

# Disadvantages of electricity

## Consumption :

- More expensive than gasoline
- Loss of fish species
- Sometimes messes up wildlife
- Dependent on precipitation
- More power plants and more pollution
- Damming can cause loss of land suitable for agriculture as well as recreation
- Cost for construction
- Change in river or stream quality
- An electric vehicle is not completely emission free
- In electricity, there are a limited number of feasible sites for a large number of dams
- Drought can affect power production
- Hydroelectric natural seasonal changes in river and ecosystems can be destroyed

## The Disadvantages of Electricity consumption

### 1) Higher Capital Costs

**While renewable energy systems need no fuel and can deliver substantial long-term savings, their up-front costs can still be prohibitive. For example, installing a solar system on your home may cost $10,000 – $20,000, and despite your desire to power your house with renewable energy, the price tag may push it out of reach.**

**On a larger scale, wind farms, solar parks, and hydropower stations require significant investment, land, and electrical infrastructure, resulting in some projects being delayed, altered, or even canceled.**
**Thankfully, renewable energy sources such as solar panels and wind turbines have continued to fall in cost due to growing economies of scale, improved manufacturing, and the popularity of renewable energy certificates.**

## 2) Electricity Production Can Be Unreliable

**Renewable energy systems rely on natural resources such as sunlight, wind, and water, and therefore, their electricity generation can be as unpredictable as the weather.**

**Solar panels lose efficiency on cloudy days, wind turbines aren't effective in calm weather, and hydropower systems need consistent snow and rainfall to maintain reliable production.**

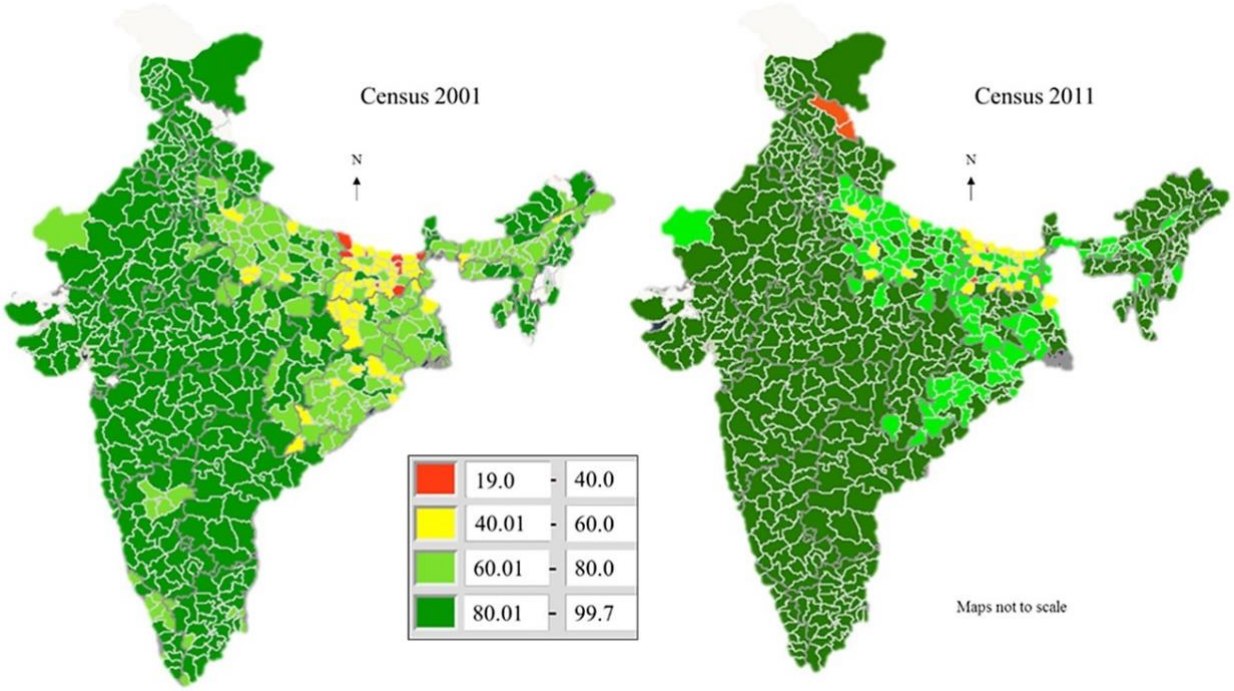
**At the same time, when renewable systems produce too much energy, they risk overloading the grid and causing major problems for network operators.**

**Australia, the country with the most solar panels per capita, is considering new export measures to prevent too much solar power from entering the grid on sunny days – and even charging system owners to do**

**so.**

**One of the advantages of non-renewable energy – such as the output from a coal power station – is a consistent flow of energy that can be ramped up and down. But the intermittency of renewables, combined with their accelerating deployment, requires many expensive**

**infrastructure upgrades to maintain reliable supply – which are ultimately paid for by the end-users.**




## 3) Energy Storage Is a Challenge

**Due to the intermittent nature of renewables, they need forms of energy storage to capture and release electricity in a consistent and controlled way.**

**Utility-scale batteries have gained significant momentum in recent years, such as the world's largest system that recently came online in California.**

**However, despite falling costs, storage technology is still relatively expensive and there are some lingering questions regarding its reliability and lifespan.**

**Thankfully, many of the existing systems in operation are generating promising results.**

**Tesla's "big battery" in South Australia – the largest of its kind when built – has delivered significant savings to local customers while keeping the lights on during grid interruptions.**

**And with the accelerating growth of renewables all over the world, it seems that large-scale energy storage is set to follow a similar path.**

Application :-

**Computers and office equipment account for largest share of commercial sector electricity consumption**

- **Five uses of electricity represent the largest shares of total annual electricity use in the commercial sector: refrigeration, computers and office equipment (combined), cooling, lighting, and ventilation.**

**Historically, electricity use for lighting usually accounted for the largest share of total annual commercial sector electricity use, but its share has declined over time mainly because of the increasing use of high efficiency lighting equipment. Conversely, the amount and share of electricity use for computers and office equipment has increased over time.**

**BSpace cooling requirements are determined by weather, climate, and building design, and by heat produced by lighting equipment, computers, office equipment, miscellaneous appliances, and building occupants.**

**The *Commercial Buildings Energy Consumption Survey* (CBECS) provides detailed data on electricity use in commercial buildings in selected years.**

**BThe AEO provides estimates and projections for annual electricity use by the commercial sector. The pie chart on the left below shows commercial sector electricity consumption by major types of end uses in the AEO2022**

## Conclusion :-

**There was a considerable increase in the peak domestic consumption, as the peak load reached 3320 MW in 2017 with an annual increment rate of 4.9%. Regarding energy efficiency, the value of total electrical energy losses reached 13% in 2017; around 90% of this loss occurred in the electrical distribution stage. Geographical distribution of the household electrical power shows that the east and middle parts of Amman have low consumption levels compared to the west residential parts.**

**The energy consumption pattern has an inverse relation with the population distribution, family size, and building characteristics in the city. This is clearly identified by addressing the downtown region that has the lowest energy consumption and the highest-density population, while the western part has the highest energy consumption and low-population density.**

**These variations can be referred to as differences in social and economic behaviors of inhabitants in both high-density and low-density population areas.**

**This analysis reflects the influence of several factors that should be taken into account in energy sustainability strategies. Energy consumption is influenced by the characteristics of households which include building size, household income, total energy cost, and building characteristics (e.g., building design, age, location, and using thermal insulation system for buildings)……**