

Impact of Energy Conservation, Renewable and Conventional Energy on Environment

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What is Energy?

It is the ability to do work

▪ Energy lights our cities, powers our vehicles, and runs machinery in factories. It warms and cools our homes, cooks our food, plays our music, and gives us pictures on television.

Types of Energy?

▪ RENEWABLE ENERGY:

Renewable energy can be generated continuously practically without decay of source.

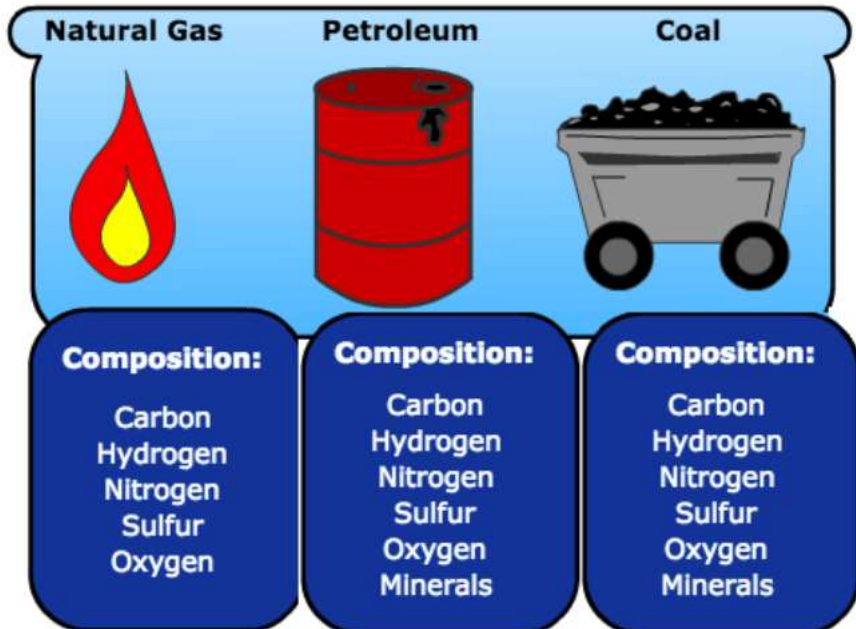
Some examples are :

- Solar energy , Wind energy , Geothermal energy , Hydro energy.

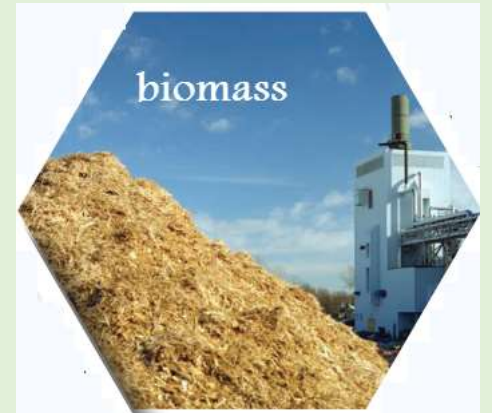
▪ NON-RENEWABLE ENERGY:

Non-renewable energy is energy that comes from the ground and is not replaced in a relatively short amount of time.

e.g. energy generated from combustion of fossil fuels , coal , gas etc.



Renewable Energy



Solar Energy



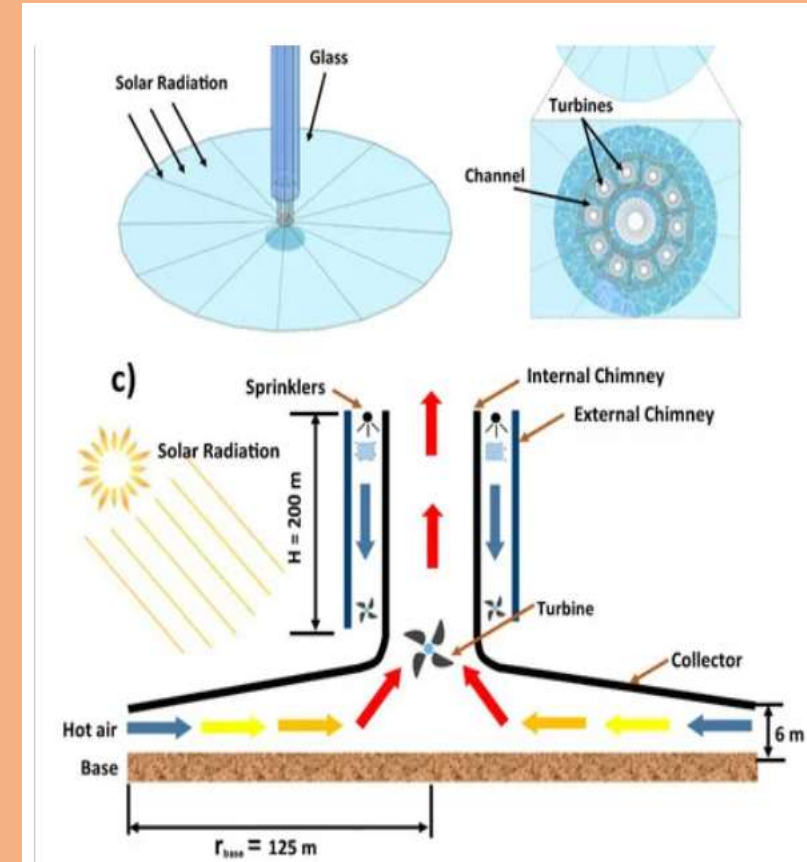
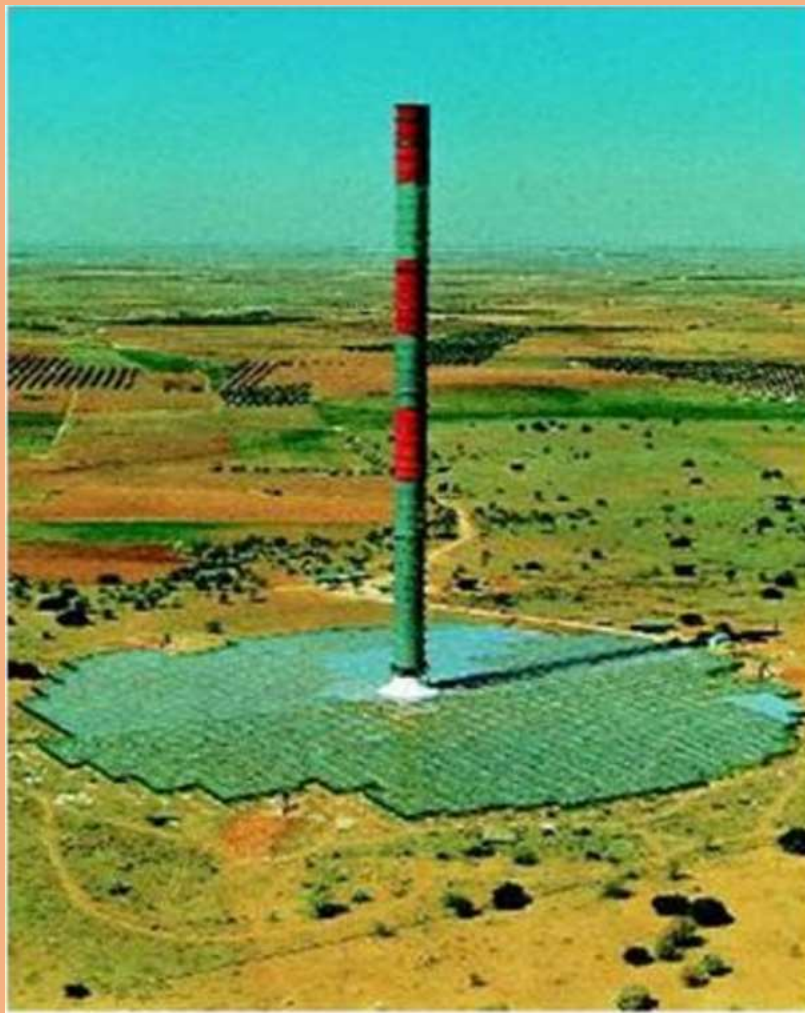
**Solar power tower
110 MW**



Solar dish/engine

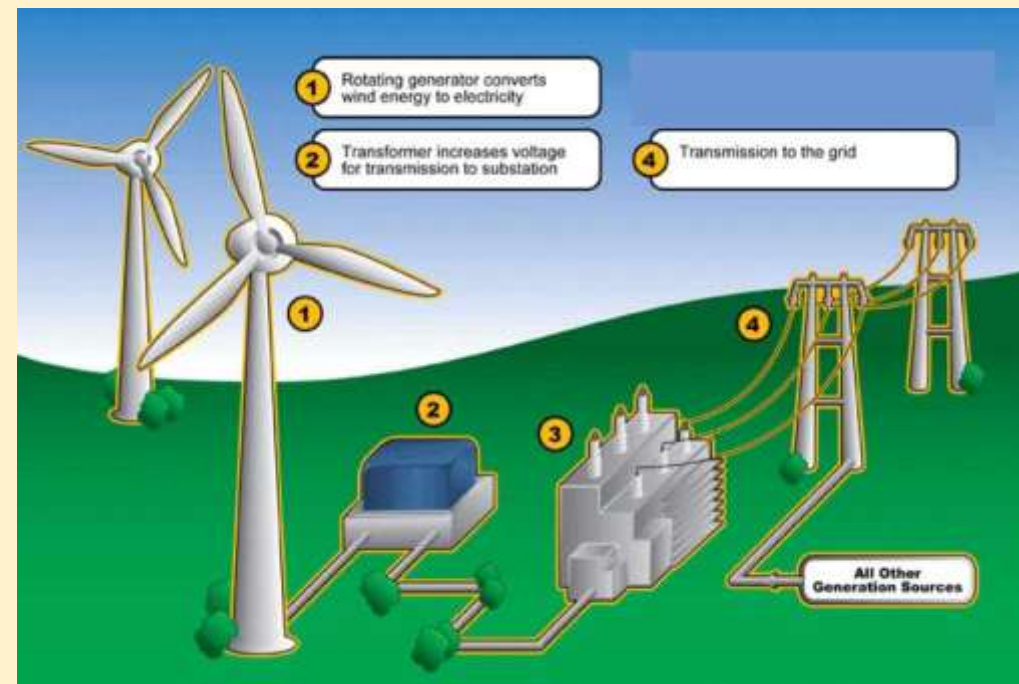


Solar thermal-electrical



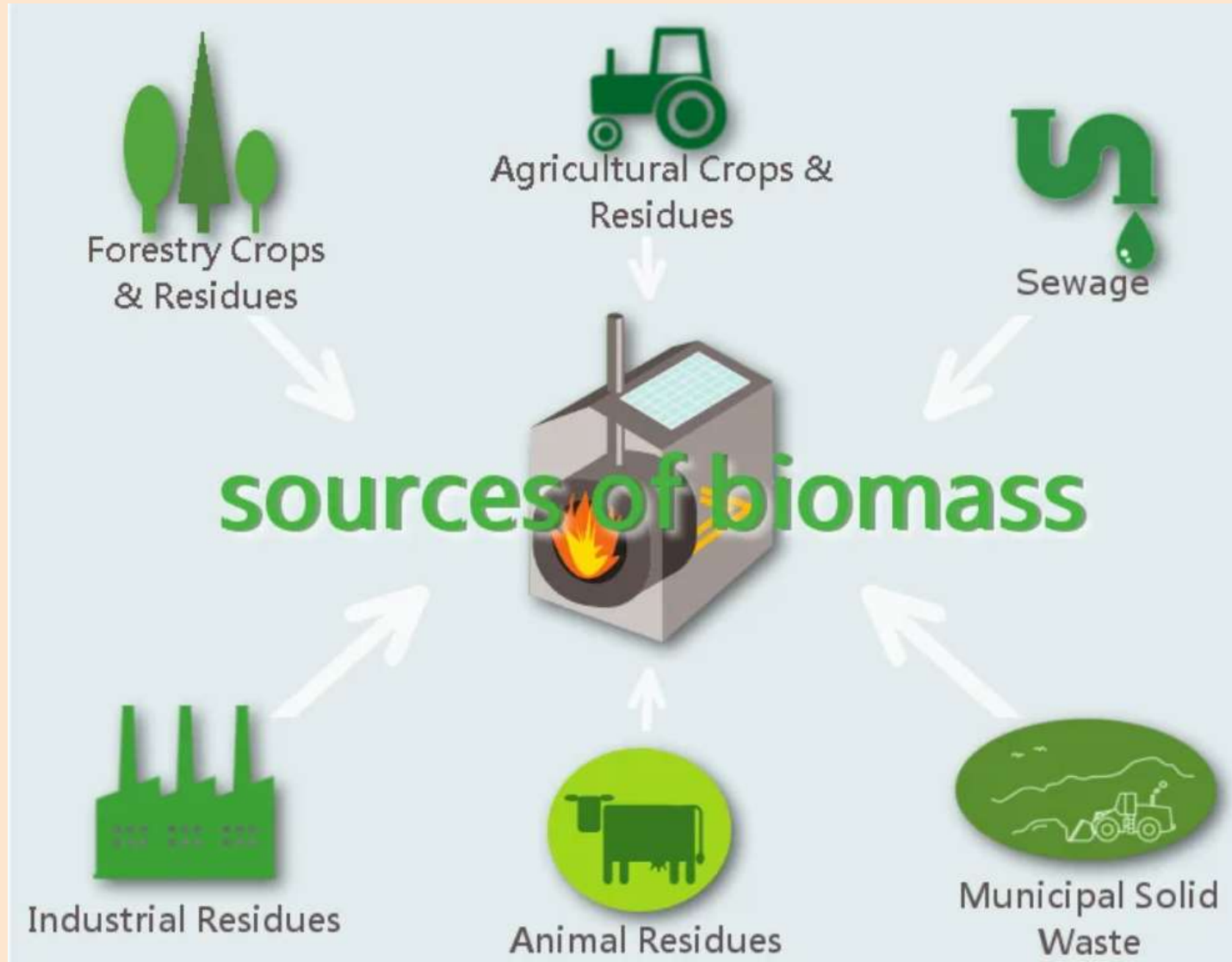
Solar Chimney for Power Generation

Wind Energy



Bio-mass Energy

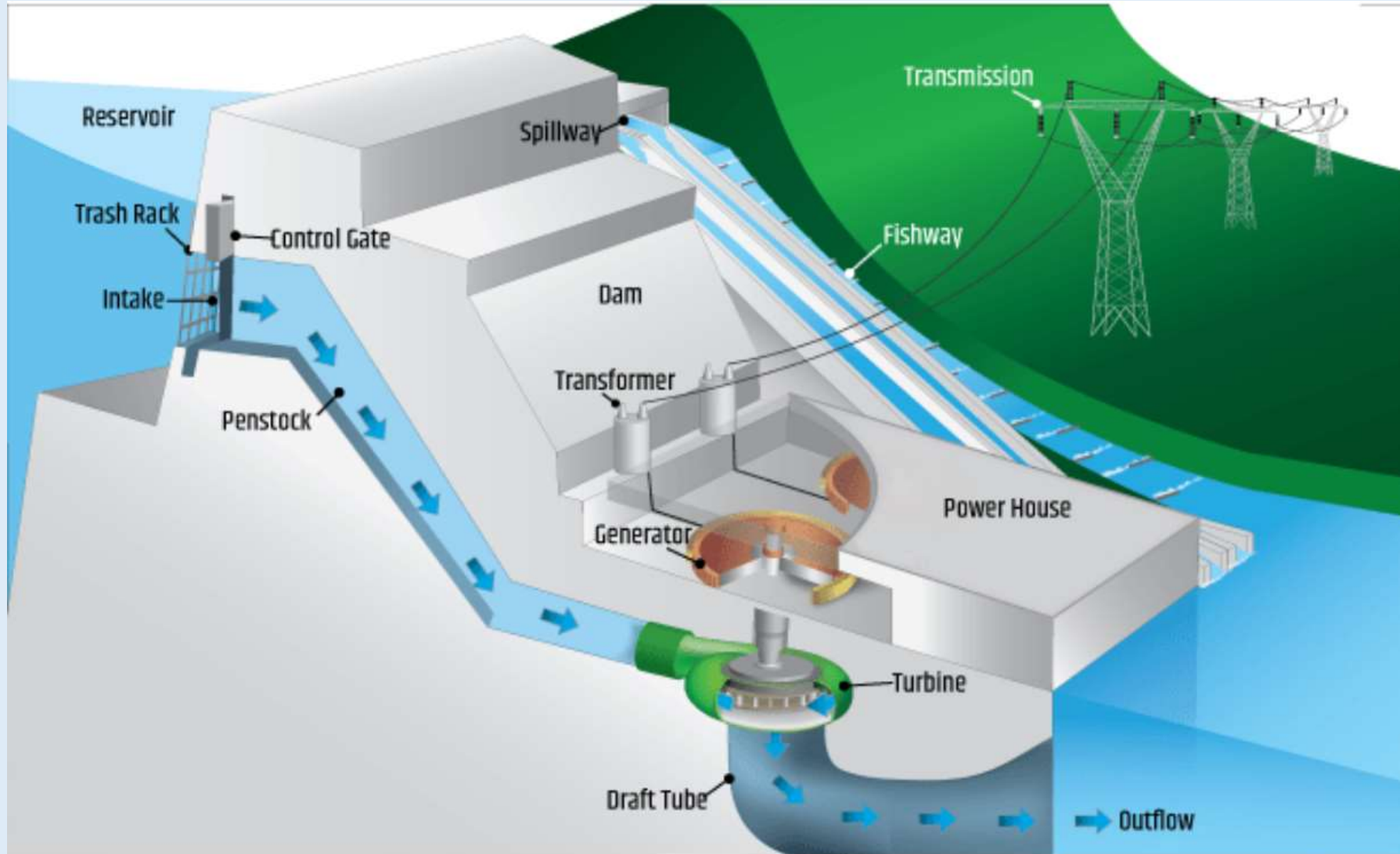
It is a renewable energy resource derived from the carbonaceous waste of various human and natural activities.



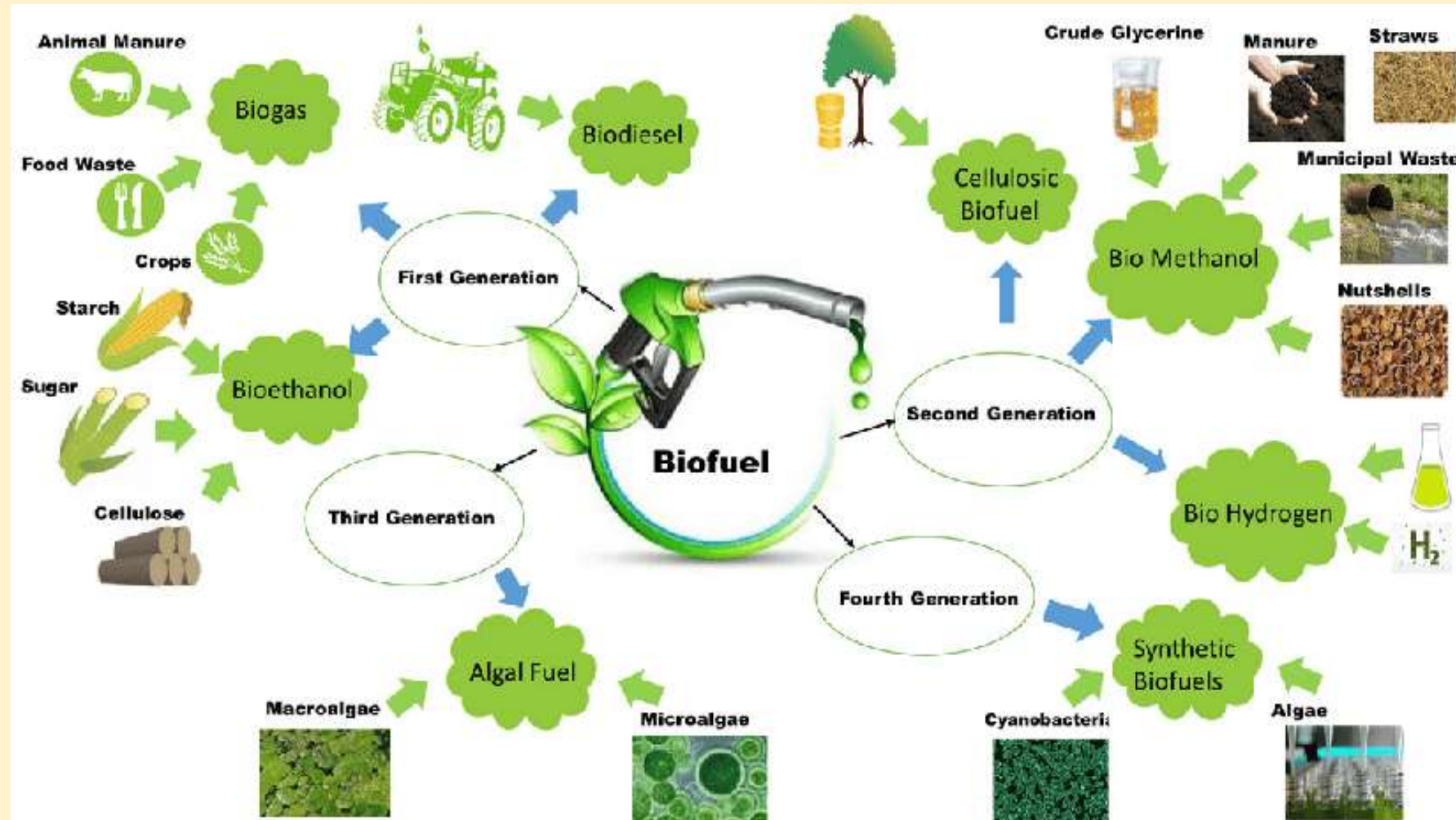
Hydroelectric Energy



Hydroelectric Energy



Biofuel energy



Types and generation of biofuels

Energy Conservation

It is the practice of decreasing the quantity of energy used for the same quantity of output.

It preserves the energy efficiently for the future.

It avoids wasting non-renewable energy resources, and can prove eco-friendly.

Energy Management, key Steps

- 1- Get commitment and appoint the right person for energy management that leads, communicates, and takes the right decisions in the right time.
- 2- Understand the current usage of energy, and compare with others.
- 3- Plan and organize the future energy policy and identify long, medium, and short term energy saving targets.
- 4- Develop an action plan
- 5- Involve the decision makers, senior management, technical and administration staff for the energy strategy.
- 6- Now Apply Controlling, Monitoring, and perform assessment report.

Why Energy conserved?



Energy conservation results:

1- Saves money

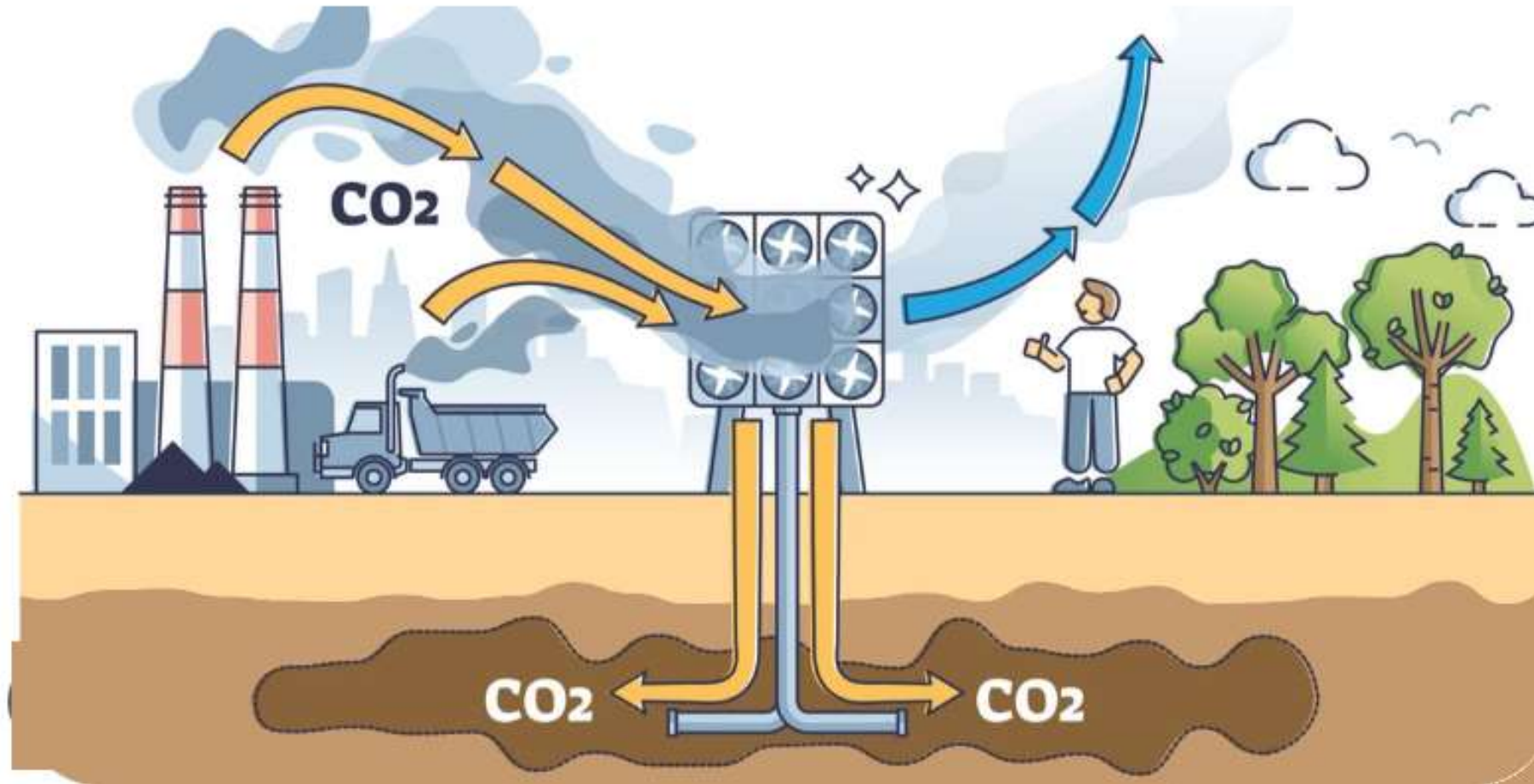
2- Reduces environmental pollution (soil ,water and air). Provides more control on climate change

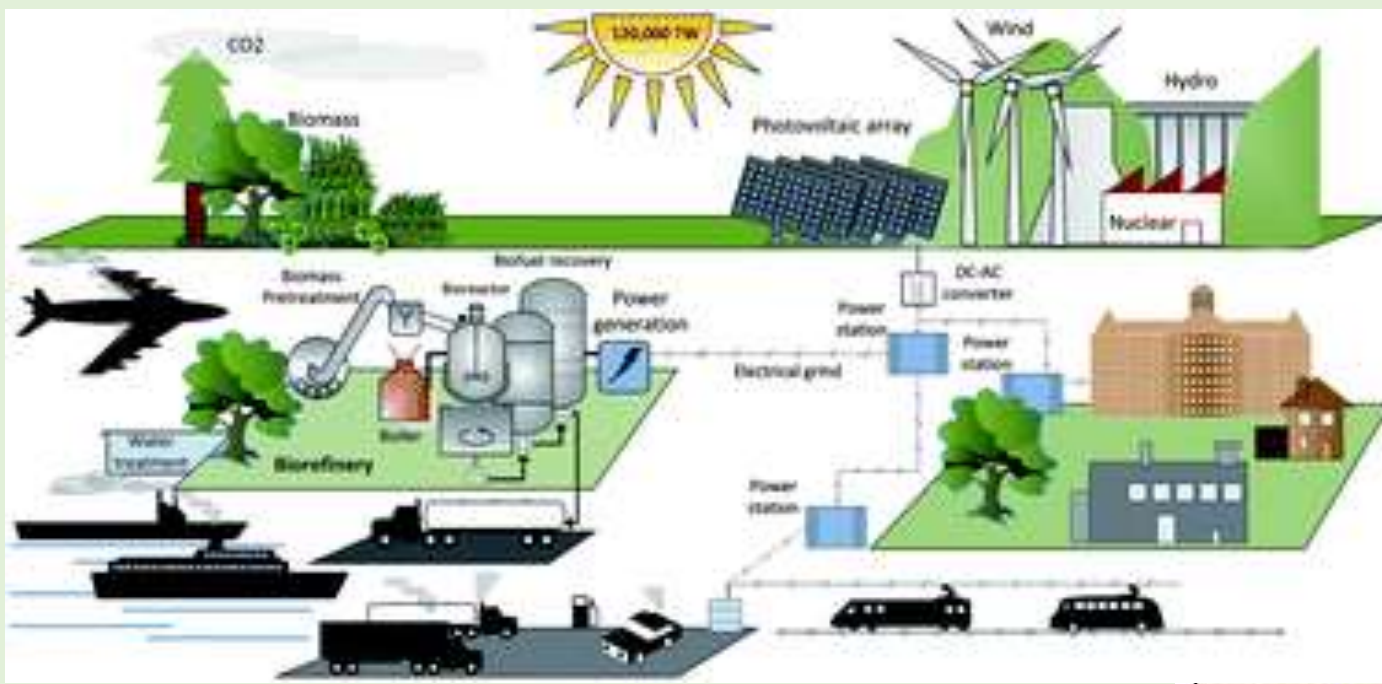
3- Save energy resources

4- Promoted the economy and improves the national security, personal security, and human comfort resources

- We have limited resources available on earth.
- Our demands are continuously increasing day by day.
- It is possible that someday most of the non-renewable resources will be exhausted and we will have to switch over to alternate energy

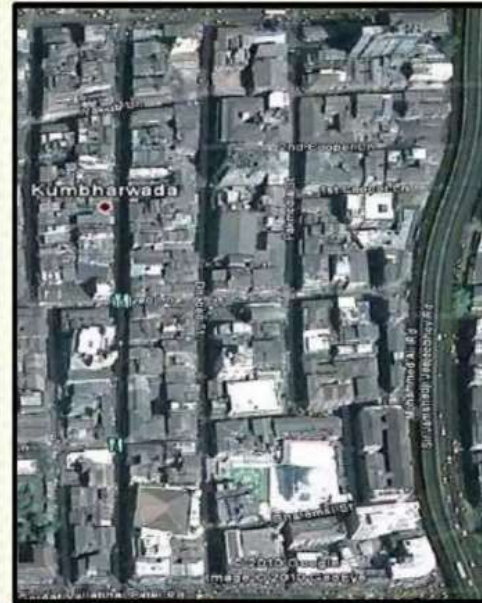
Environmental Pollution





Impact of adopting
Renewable energy
alternatives and energy
conservation

A Holistic Transformation



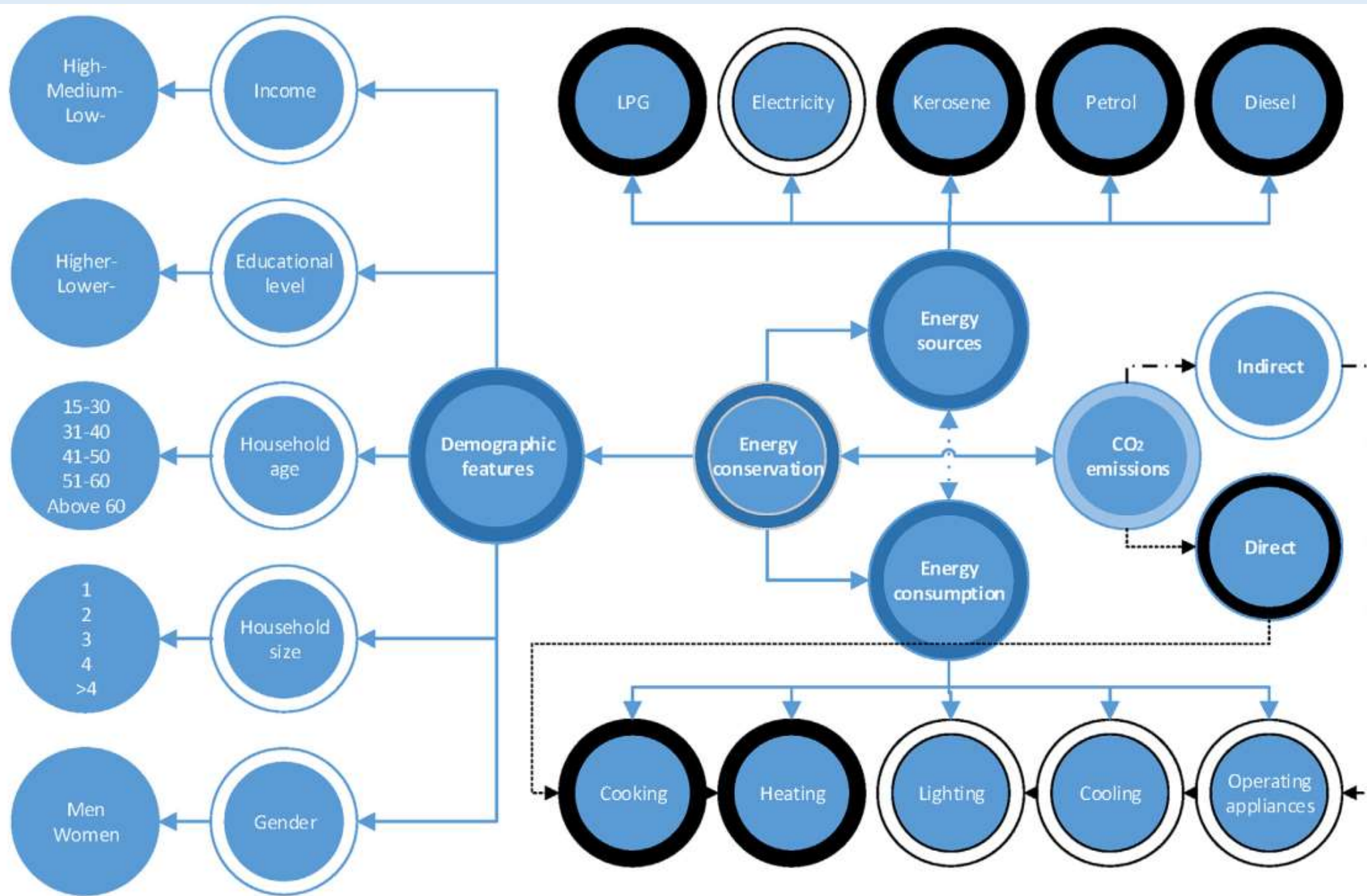
To create a sustainable
living & working
environment



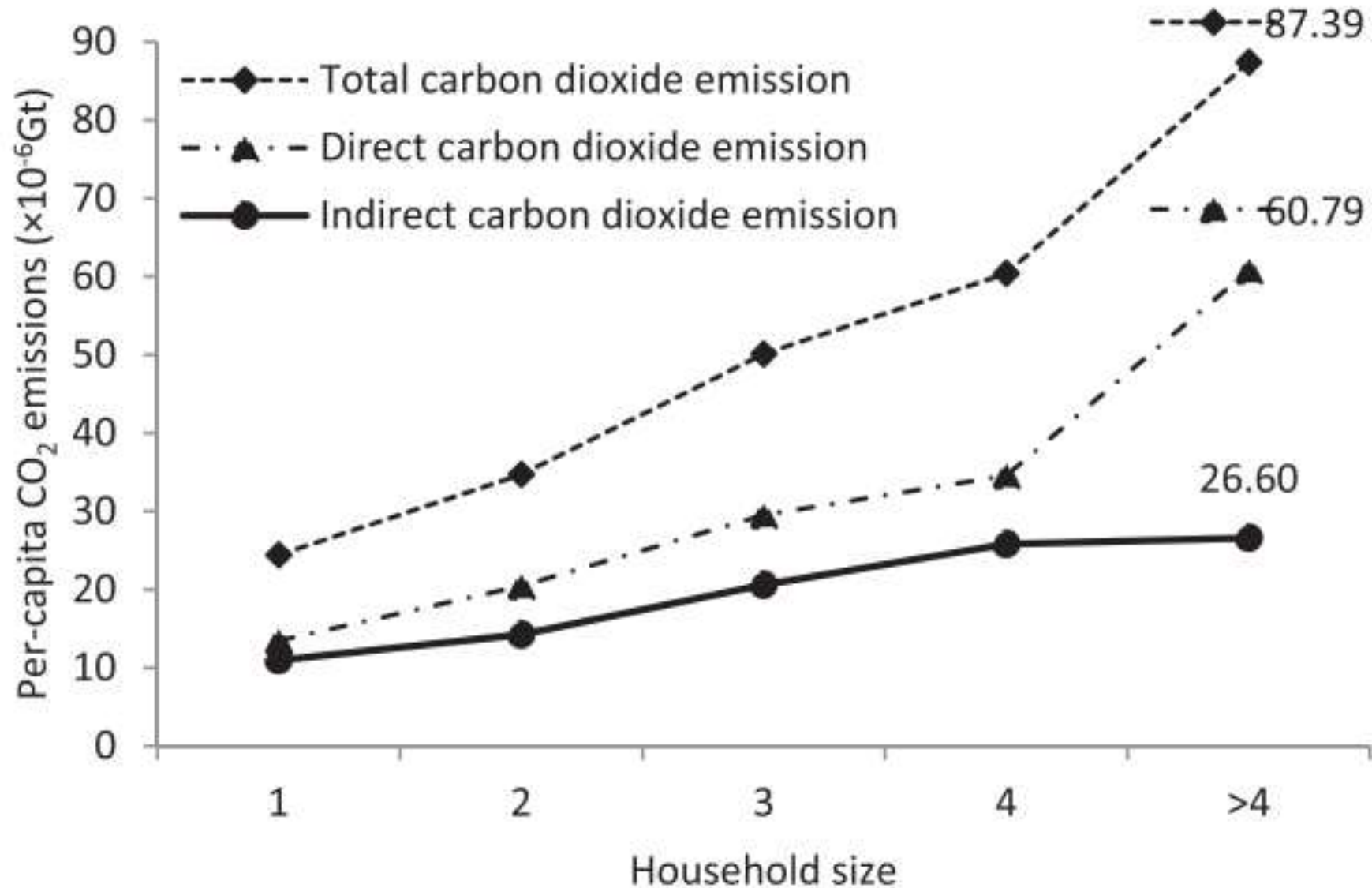
Conservation of Energy at Various Levels

- (A) Energy conservation at household level
- (B) Energy conservation at community level
- (C) Energy conservation in industry and other places
- (D) Energy conservation in transportation sector

Factors affecting the CO2 emissions from households



Effect of household size on direct, indirect, and total CO₂ emitted from a city in 2016



Conservation of Energy at Community Level

- All unnecessary lights should be turned off especially when conference rooms etc. are not in use.
- Energy uses should be minimized during peak demand hours.
- Set computers, monitors, photocopiers and other business equipments to their energy saving mode. Turn them off during long idle hours such as lunch breaks.
- Skylights should be used for warehouses.
- Ensure that offices having air conditions have proper windows and all doors are closed when the air conditioner is in use.

Conservation of Energy in Industry and other Places

(a) Auditing:-

Regular monitoring and audit of energy consumption results in energy conservation.

(b) Process modification:-

Process modification means replacement of old and more energy consuming processes by the new energy efficient processes. Old factories should now employ process modification.

(c) Improved measuring instruments:-

We can use new technologies and energy efficient instruments and processes to conserve energy.

(d) Energy loss reduction:-

A lot of energy is wasted everyday. We can reduce energy loss by using following measures, for example: thermal insulation of fuel tanks can be done, Ceramic fiber sealing of furnaces, electrical tracing of liquid fuel lines instead of conventional steam heating.

(e) Light load reduction:-

A significant amount of energy can be saved by reducing light load. Bulbs have been replaced by tube lights. Nowadays CFLs have proved very helpful in reducing energy needs for lighting purposes.

Conservation of Energy in Transportation

(a) REDUCTION OF FUEL CONSUMPTION:-

Fuel consumption can be reduced in the following ways:

- Use public transportation as much as possible instead of using own vehicles.
- Car speed should be maintained as far as possible 50 to 60 km/hr.
- Do not use choke unless necessary, when choke is used, put it off as soon as engine is warmed up, if there is a starting trouble, press clutch to start the engine.).
- Avoid free frequent starts and stops to reduce fuel consumption. Release clutch pedal gradually and simultaneously press accelerator to racing and or jerking.
- Never race engine when declutched. Declutch fully when changing gears on clutch pedal because this increases clutch wear and fuel consumption.
- Do not run on hand brake and preferably install a warming light device. Apply brakes gradually as far as possible. Anticipate need for braking. Switch to lower gears on gradients (up/down) at the right time. All these will be helpful in reducing fuel

Conservation of Energy in Transportation

consumption

- If possible it is always better to live near workplace.

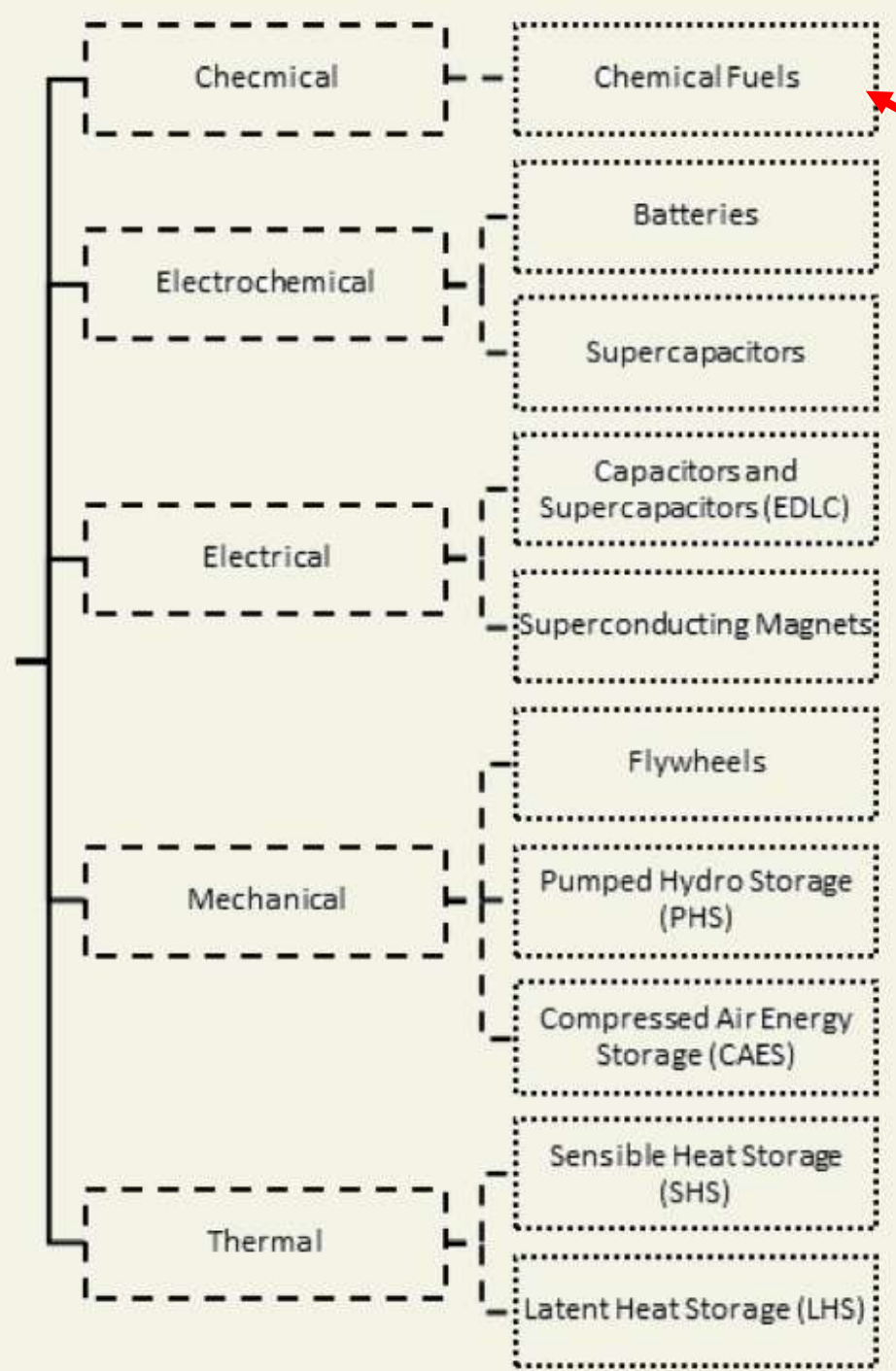
(b) FUEL ECONOMY- MAXIMIZING BEHAVIOUR:-

Fuel economy maximizing behaviour describes techniques that drivers can use to optimize their automobile fuel economy. The energy in fuel consumed in driving is lost in many ways including engine inefficiency, aerodynamic drag, rolling friction and kinetic energy lost due to braking. They include following measures-

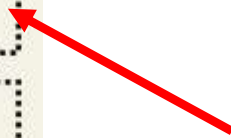
- Moderate driving, drive at low speed

How Energy is stored?

Energy Storage Systems (ESS)



Chemical :
Endothermic
(heat absorbent)
or exothermic
(heat releasing)
Conventional fuel



- **Energy conservation:** Is the term used for reducing the consumption through using less energy service. Energy conservation is not about making limited resources last longer, but it is a process of doing nothing more than delaying a crisis until we finally run out of all our energy resources.
- **Energy Efficiency:** The phrase energy efficiency is often used to describe any kind of energy saving measure, though technically energy efficiency is different from energy conservation.
- **Energy Management:** Is a term used for saving or reducing the use of energy in businesses, public sector or government organizations and homes. It is the art of using optimum energy to maximize profits and minimize costs thereby improving the economic competitiveness.

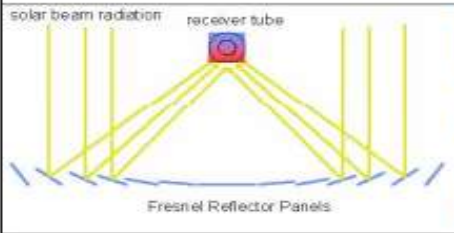
Applications

نموذج لبیت منخفض
الطاقة تم بناءه كعمل
بحثي

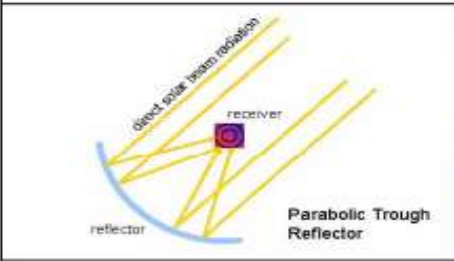


Hybridization of solar power plant and water desalination

Linear Fresnel Concentrating Solar Thermal Collector



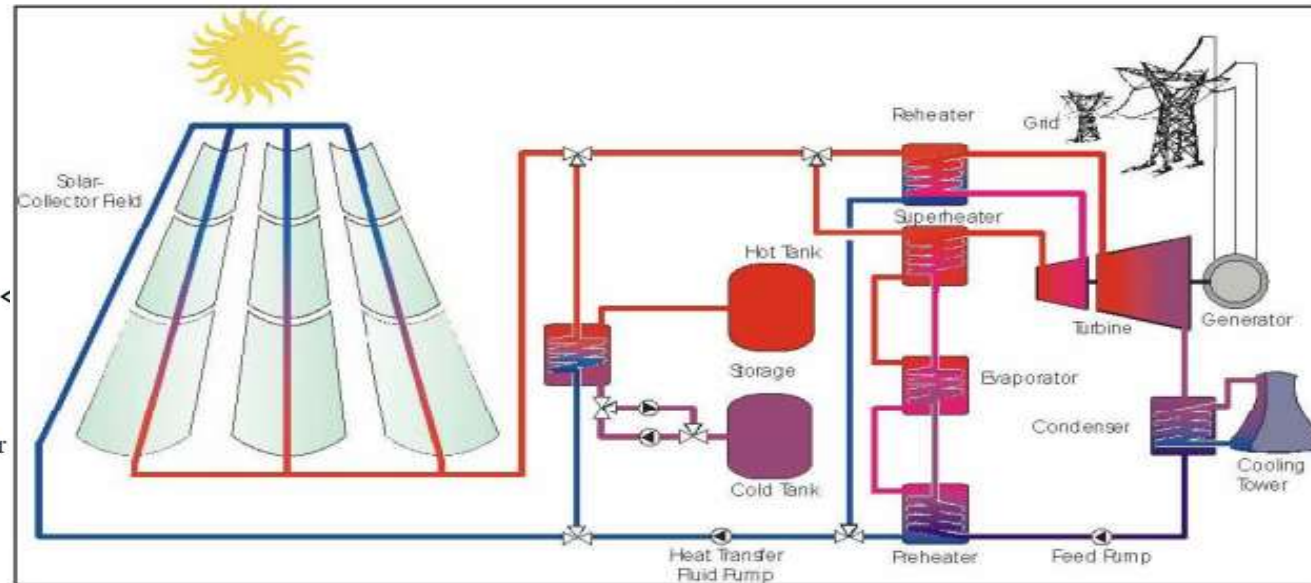
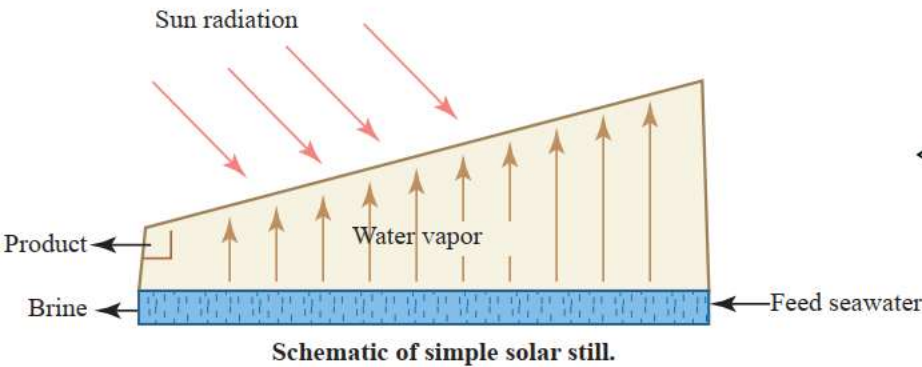
Parabolic Trough Concentrating Solar Thermal Collector



Concepts from concentrating solar power can be applied to solar distillation...generate electricity, then make water from waste heat or electricity

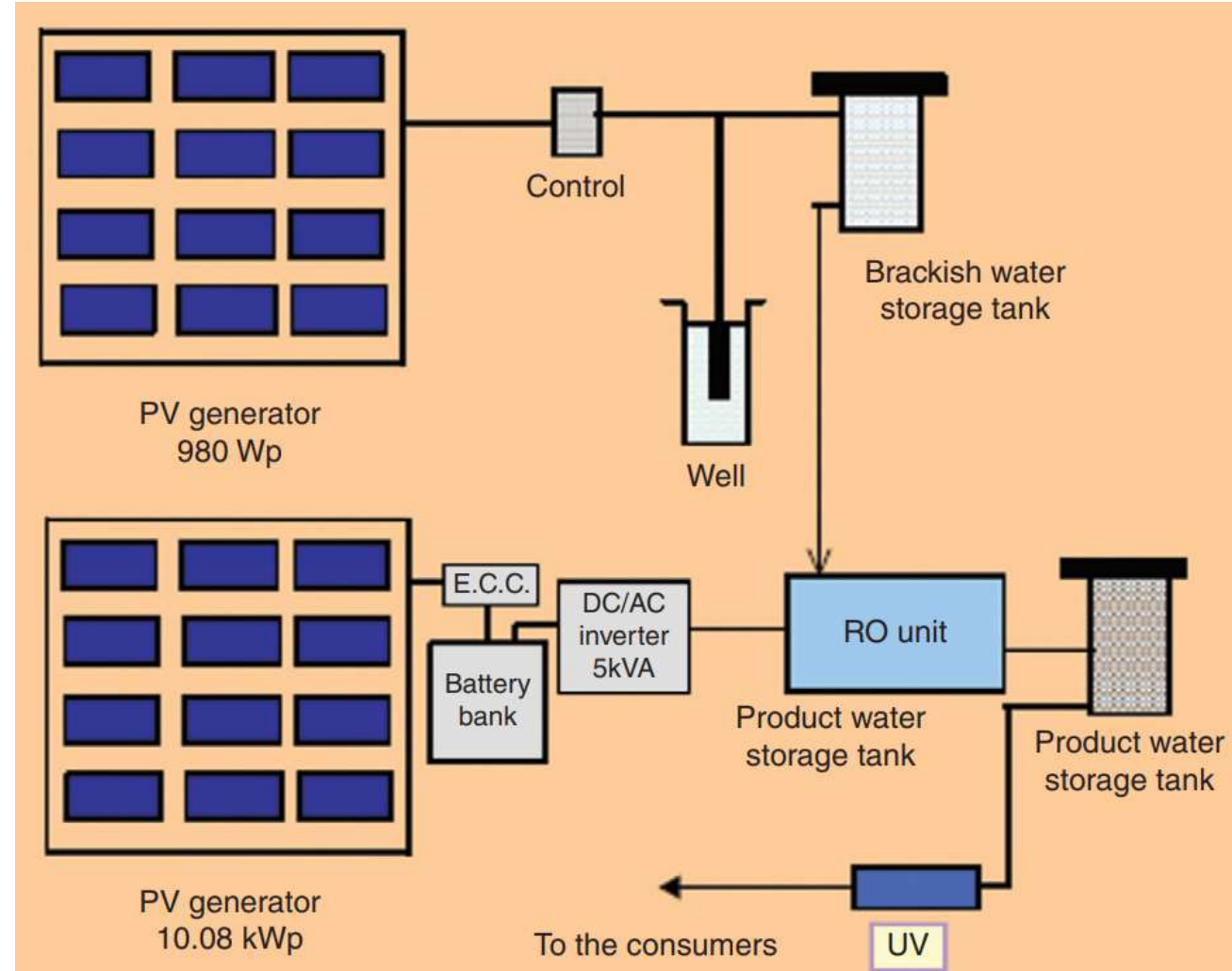
theoretical performance can be ~100X better than solar still

Solar Distillation

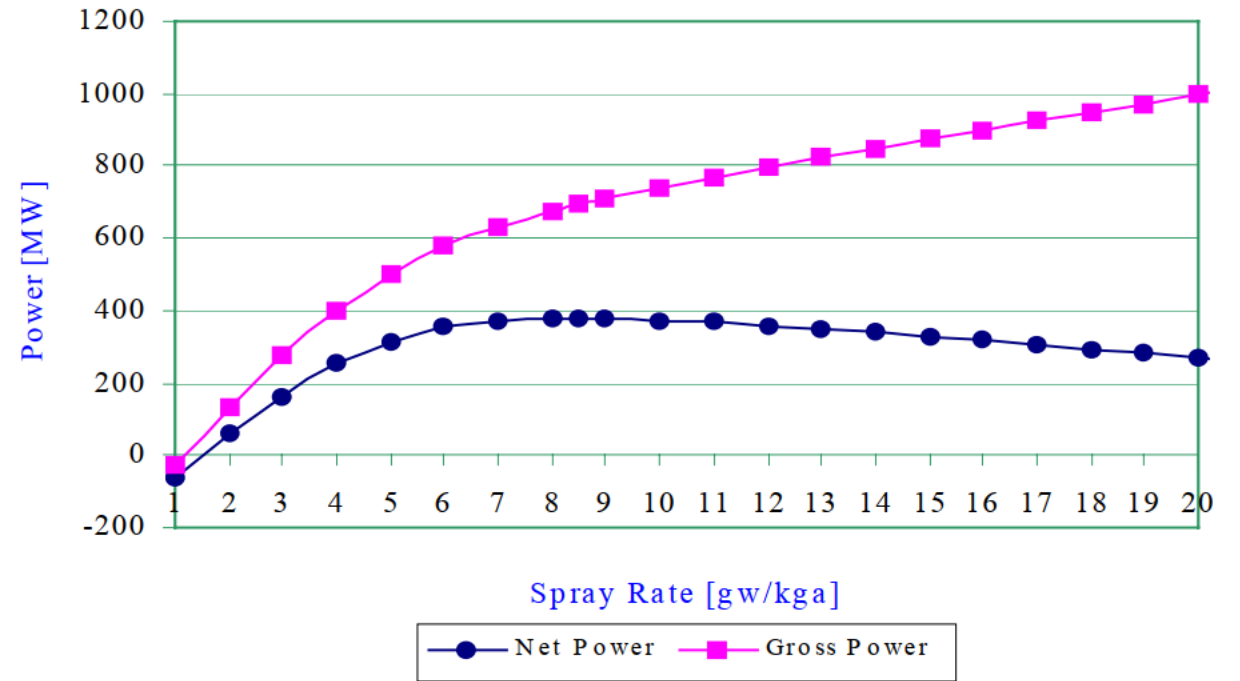
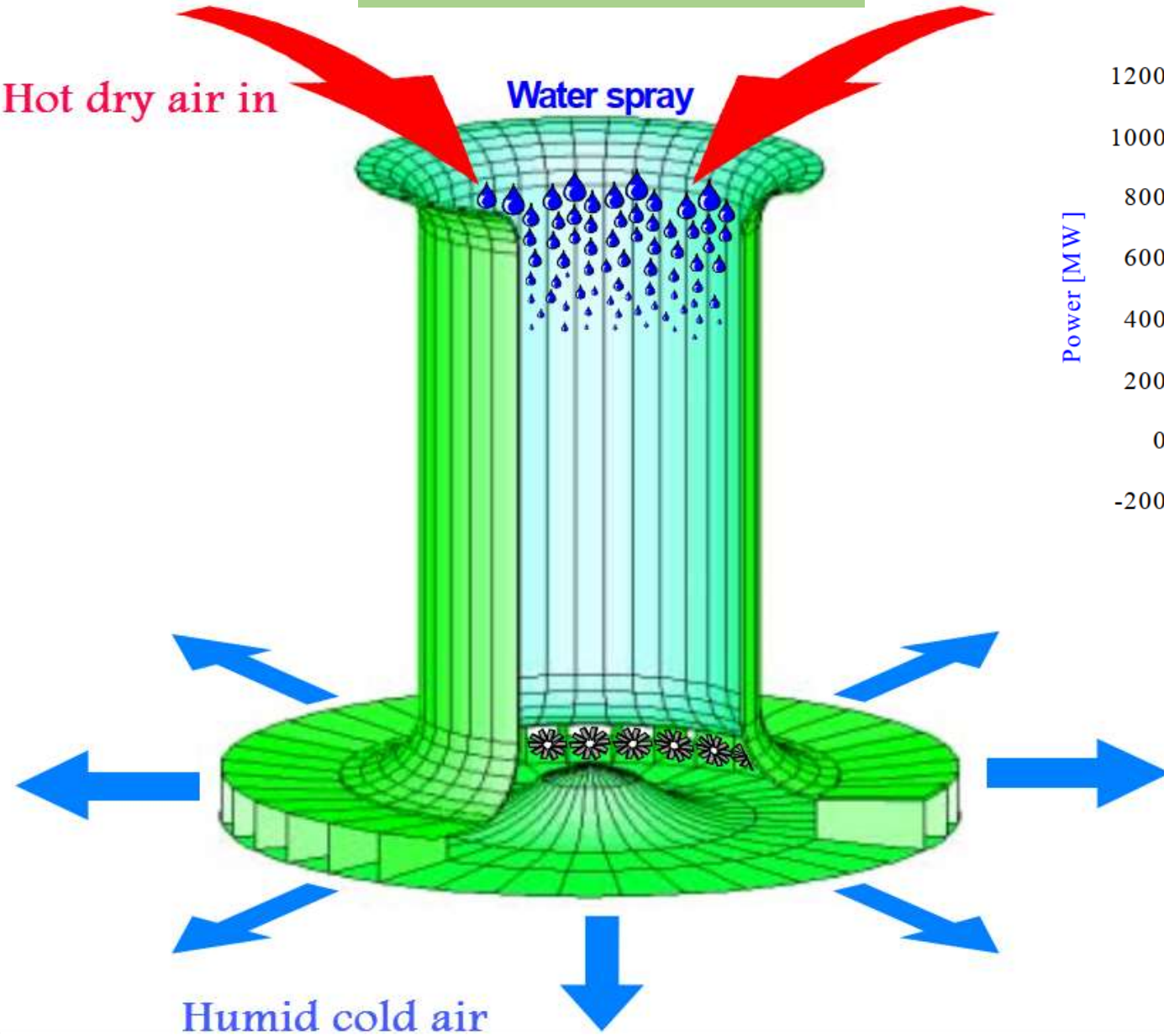


Solar electrical generator for pumping station and RO unit

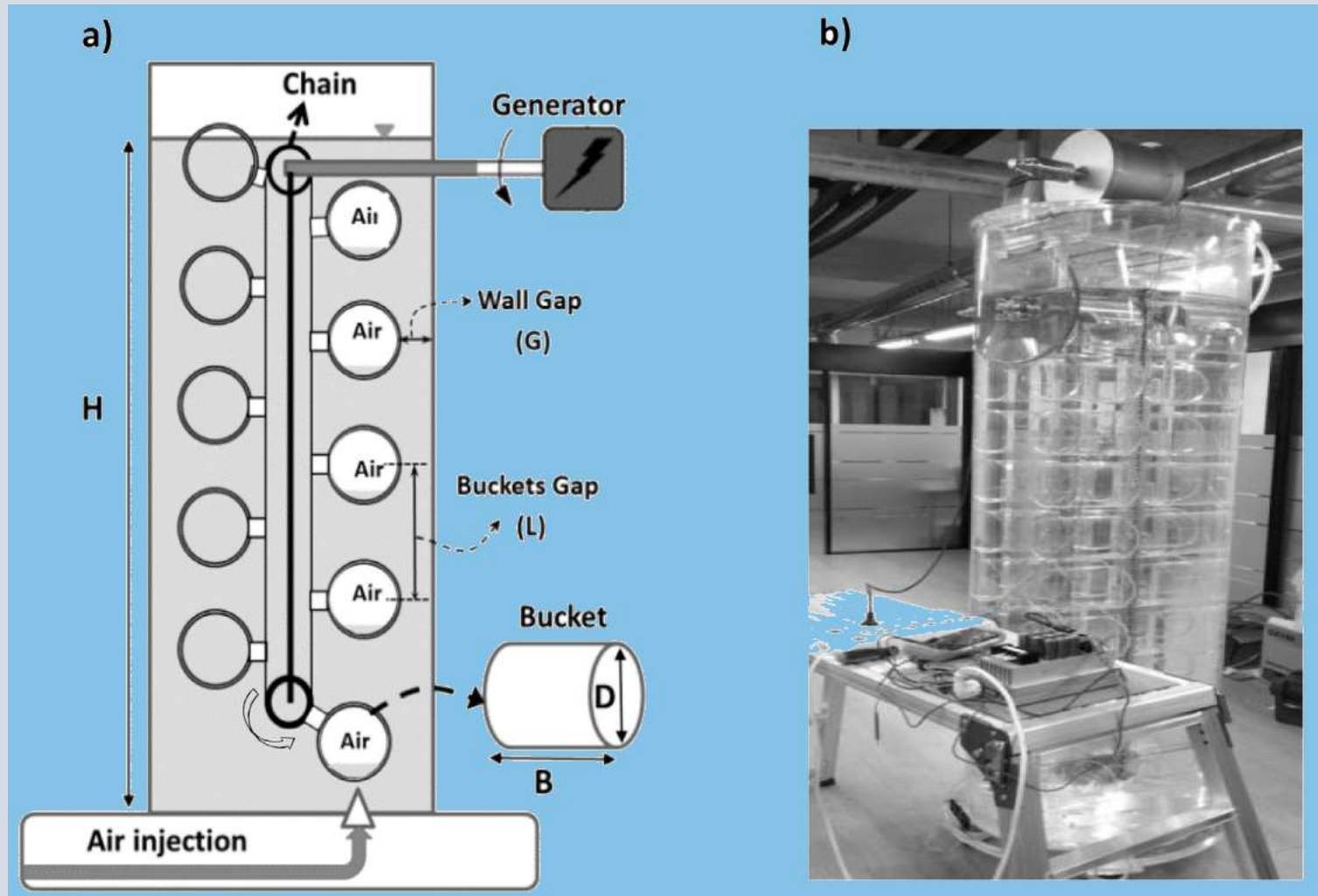
The total PV installed capacity is 10.89 kWp, 10.08 kWp to drive the RO unit and 980 Wp for water pumping. The head of the submersible pump is 50 m from the surface level and the product water capacity from the RO unit is about 600 lph.



ENERGY TOWER



Buoyancy-power generator tank



The best way to protect the future is
to create it



Thanks