ENVIRONMENT AND ENERGY

- All energy sources have some impact on our environment

- Fossil fuels do substantially more harm than renewable energy sources

ENERGY: ENVIRONMENT ISSUES

- Burning fossil fuels is changing the Earth's climate...
  - increasing global average temperatures
  - causing melting of polar sea ice and raising sea levels
  - acid rain and CO_2 emissions
  - stronger hurricanes
  - recurrent high tide flooding

Over the past 20 years, nearly three-fourths of human-caused emissions came from the burning of fossil fuels!!!

ENERGY

Thermoelectric

Hydroelectric

Nuclear

Solar

Wind

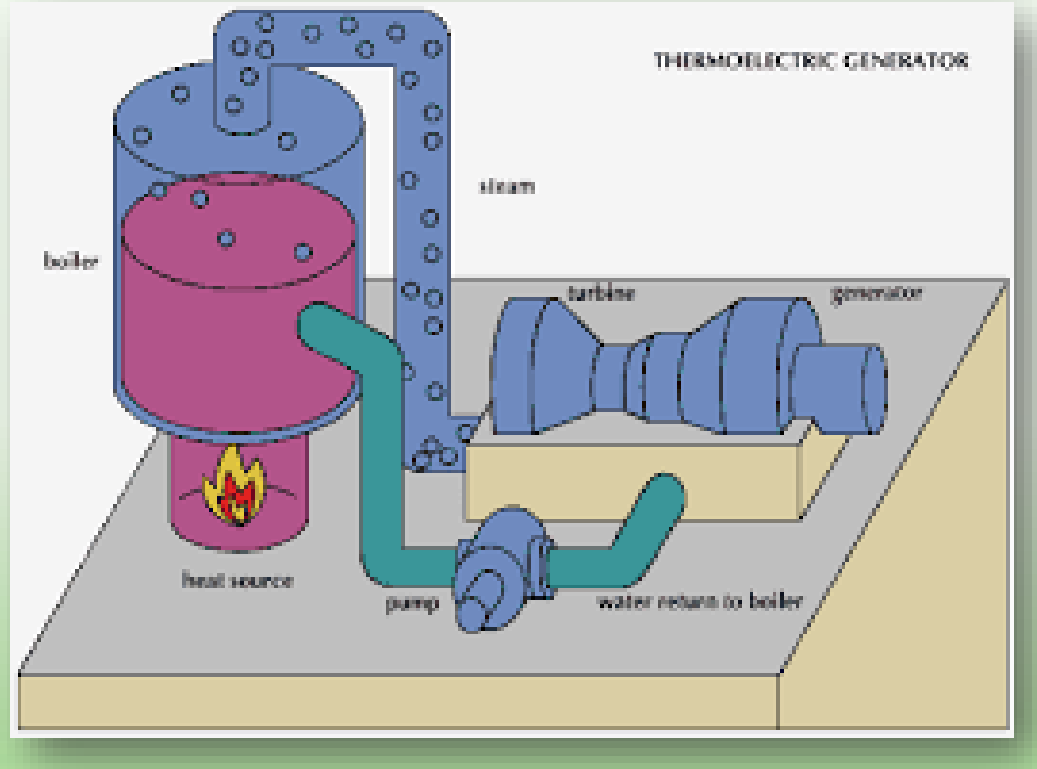
- What is it?
- Global perspective
- Advantages
- Disadvantages

Thermoelectric Energy

Thermoelectric energy

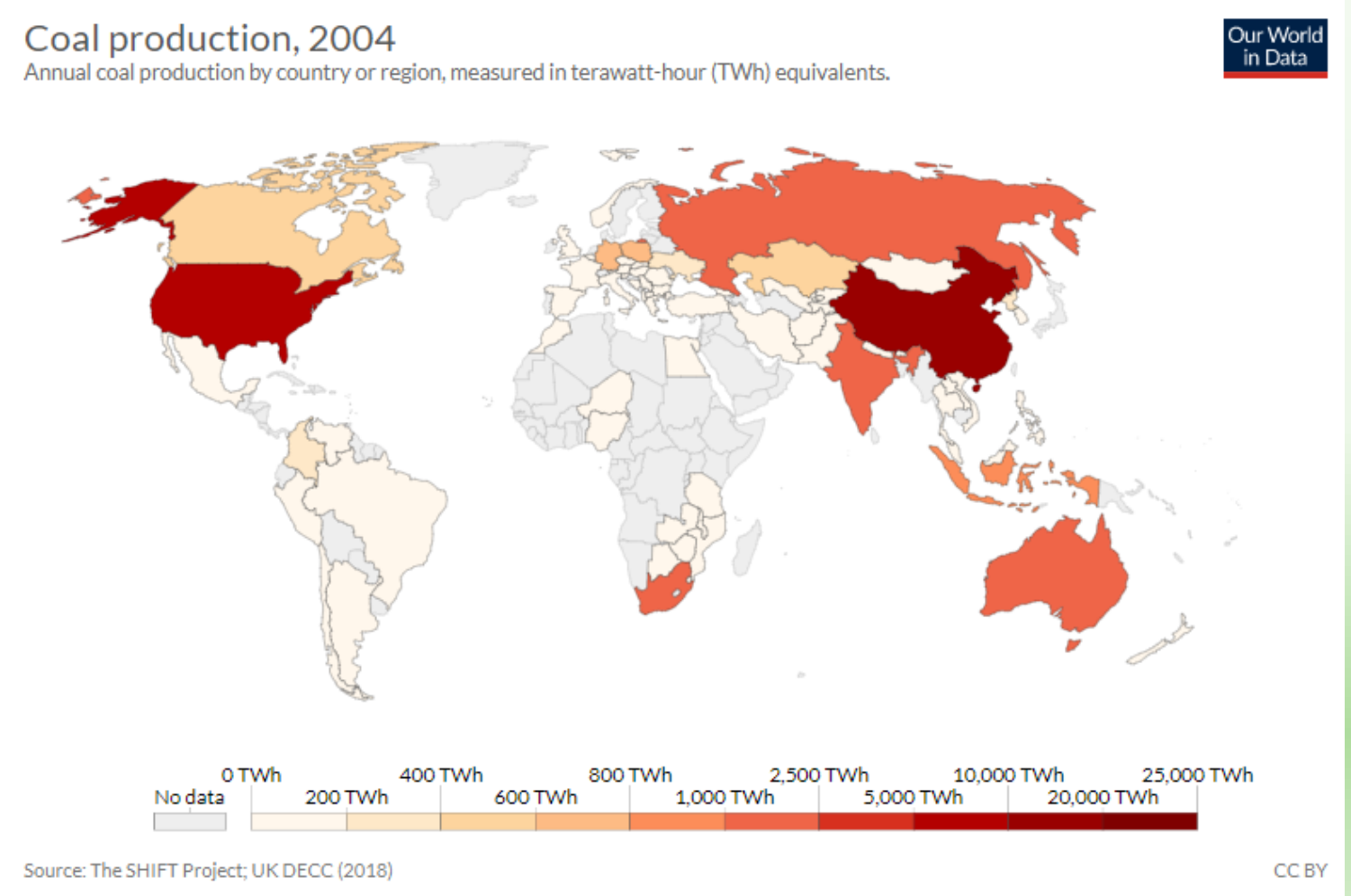
What is it?

- Energy produced by burning fossil fuels, like oil, coal or natural gas.
- The fuels are placed in a boiler that heats the water and its steam drives turbines.



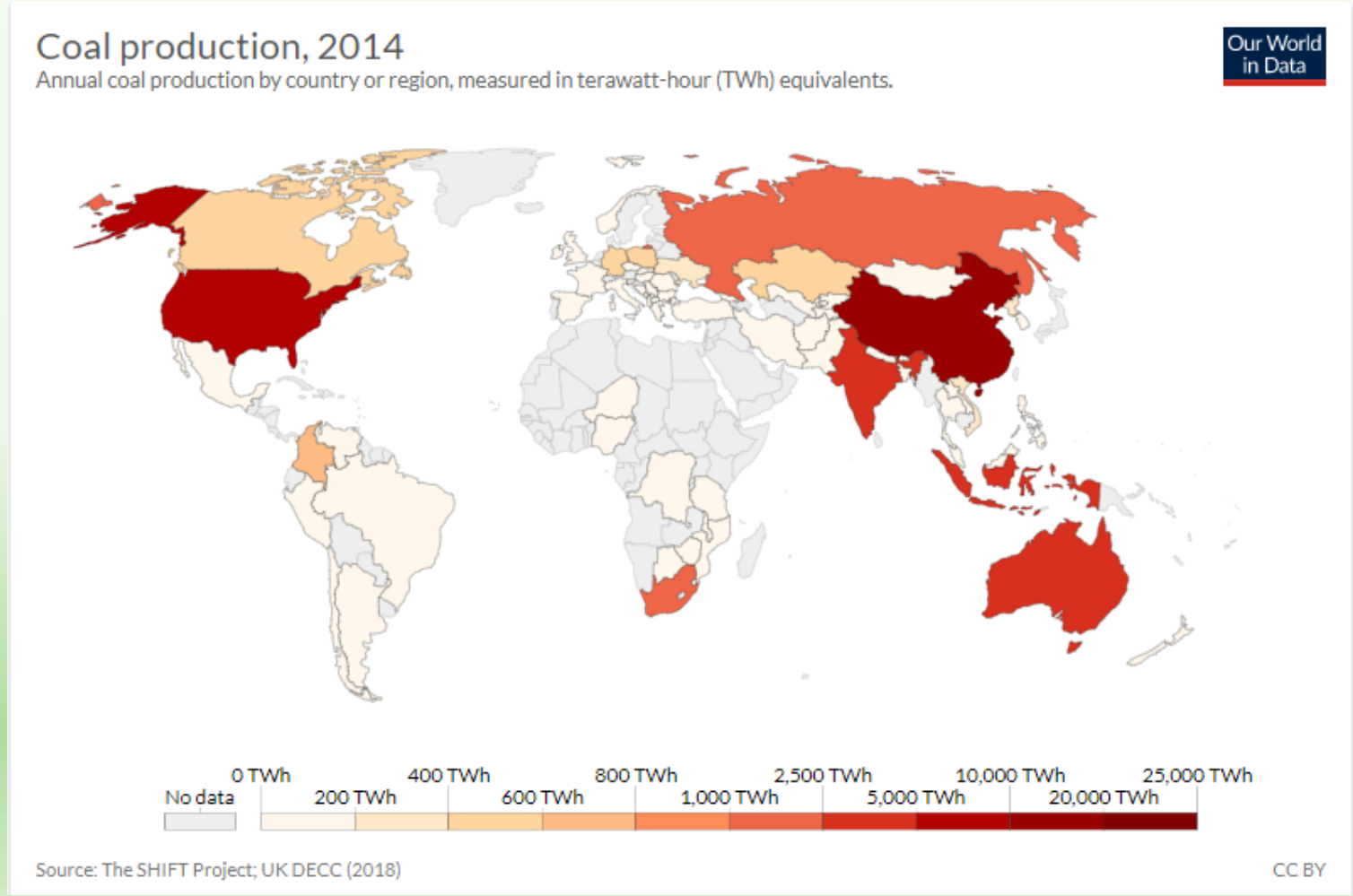
Thermoelectric energy

Global perspective



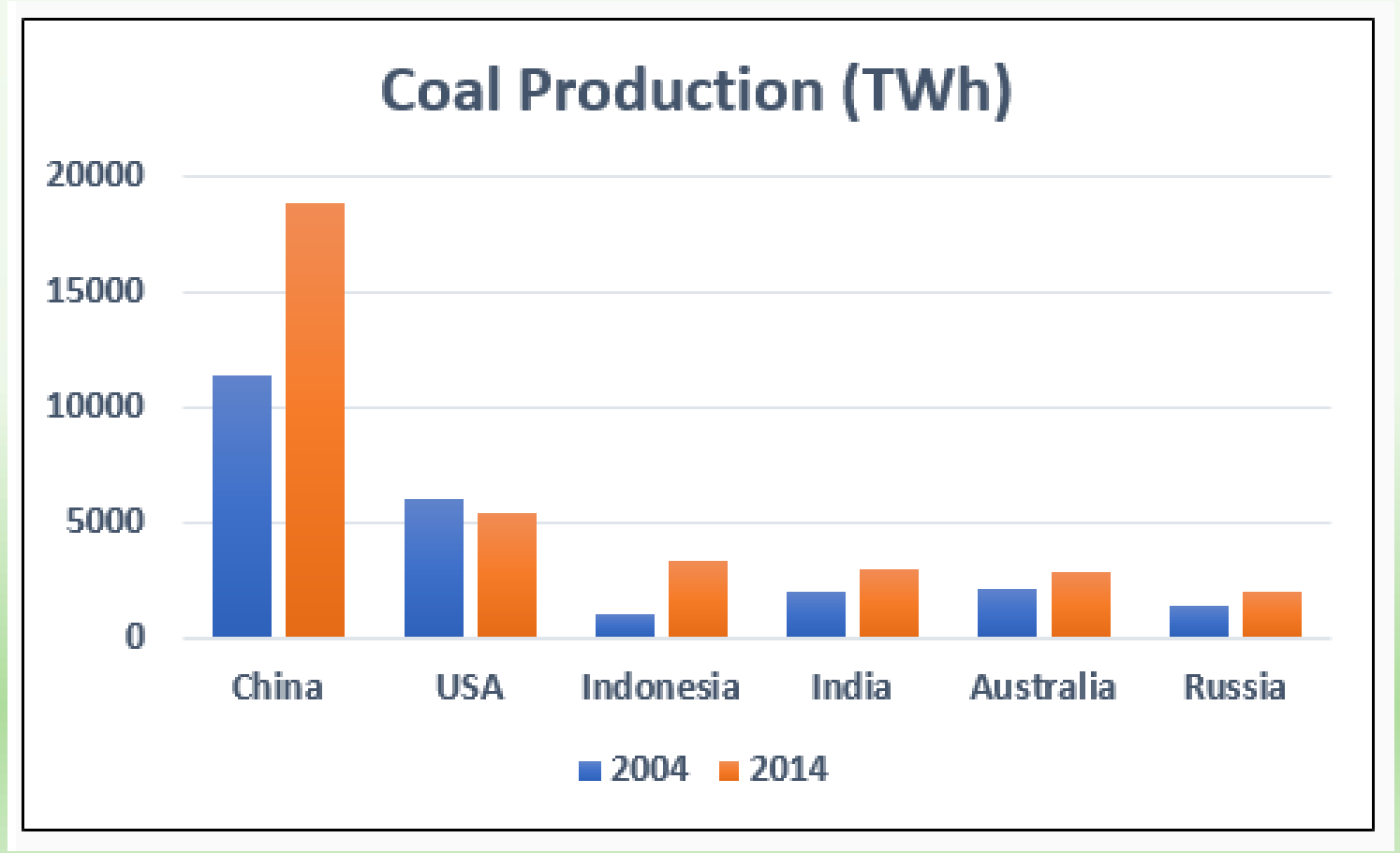
Thermoelectric energy

Global perspective



Thermoelectric energy

Global perspective



Thermoelectric energy

Advantages

Easy to find

Extremely efficient

Available in plenty

Easier to transport

Generate thousand of jobs

Thermoelectric energy

Disadvantages

Environmental impact

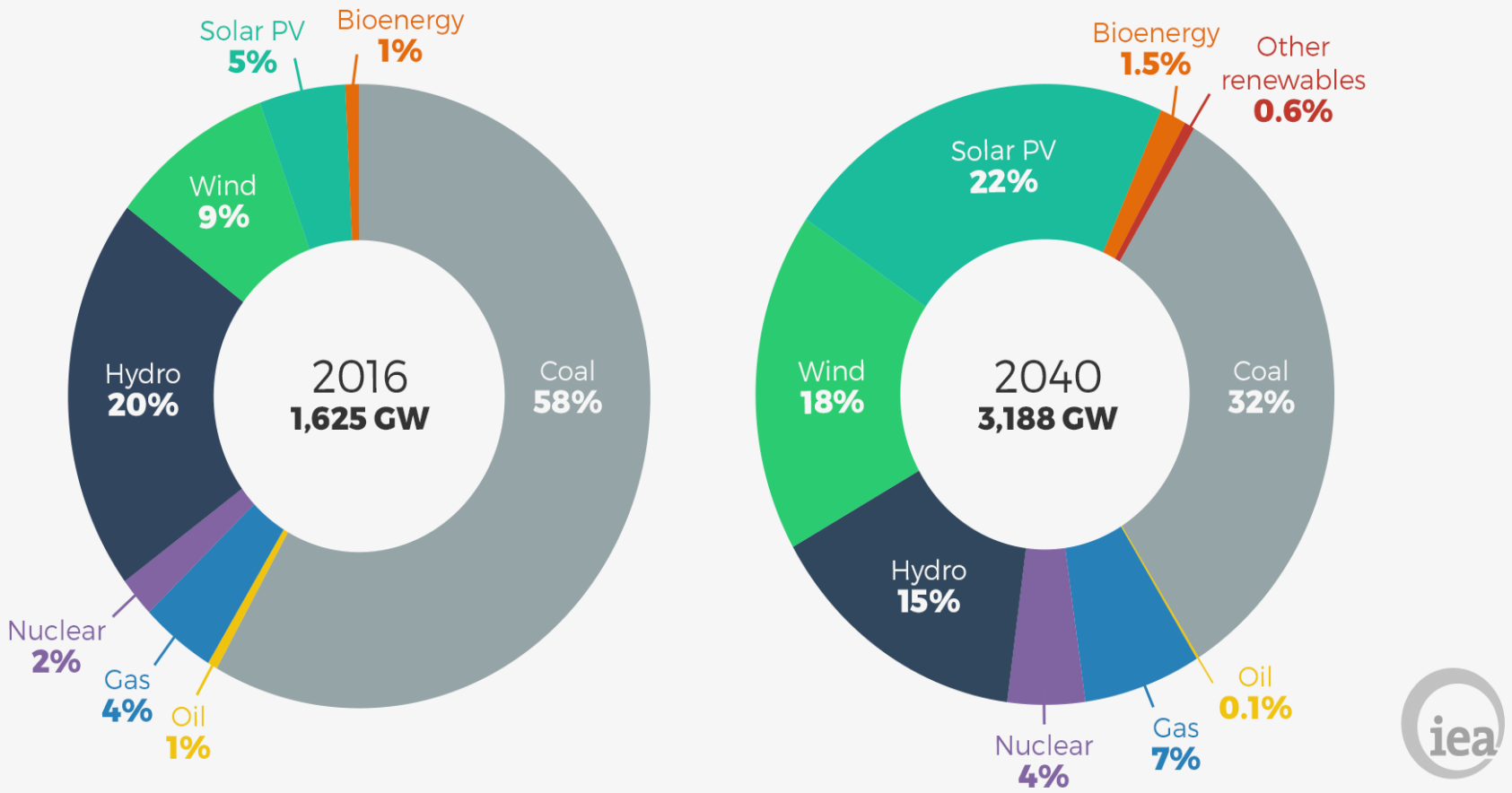
Non-renewable

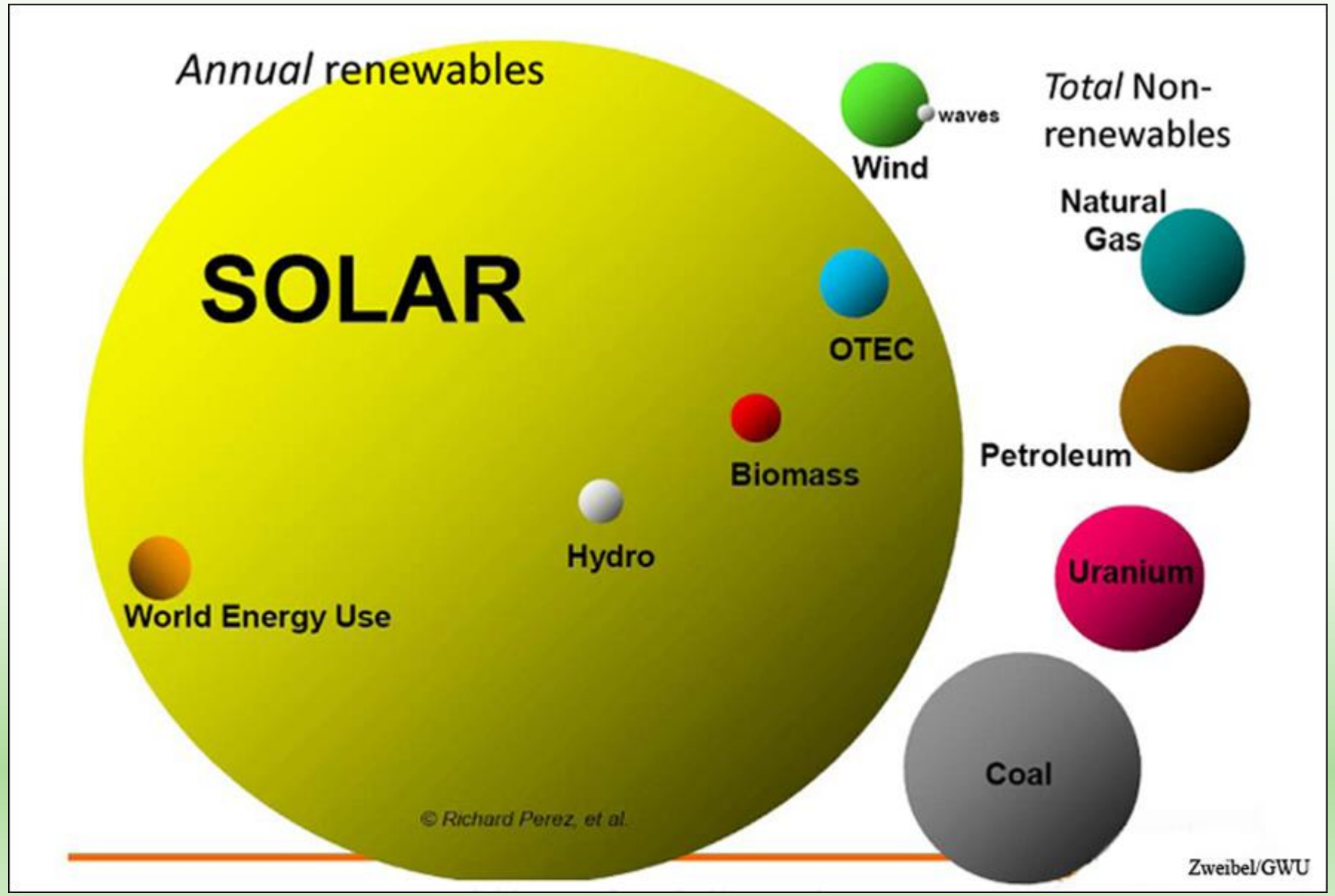
Public health issues

Needs truckloads of reserves

Installed power generation capacity in China in the New Policies Scenario

World Energy Outlook 2017

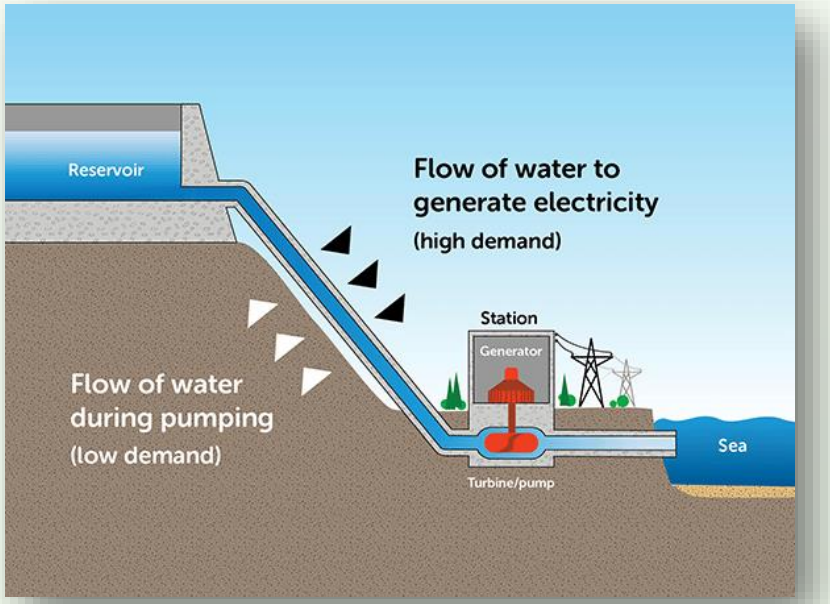



Annual renewables
SOLAR
World Energy Use
Hydro
Biomass
OTEC
Wind
waves
© Richard Perez, et al.
Total Non-renewables
Natural Gas
Petroleum
Uranium
Coal
Zweibel/GWU

Hydroelectric Energy

Hydroelectric energy

What is it?

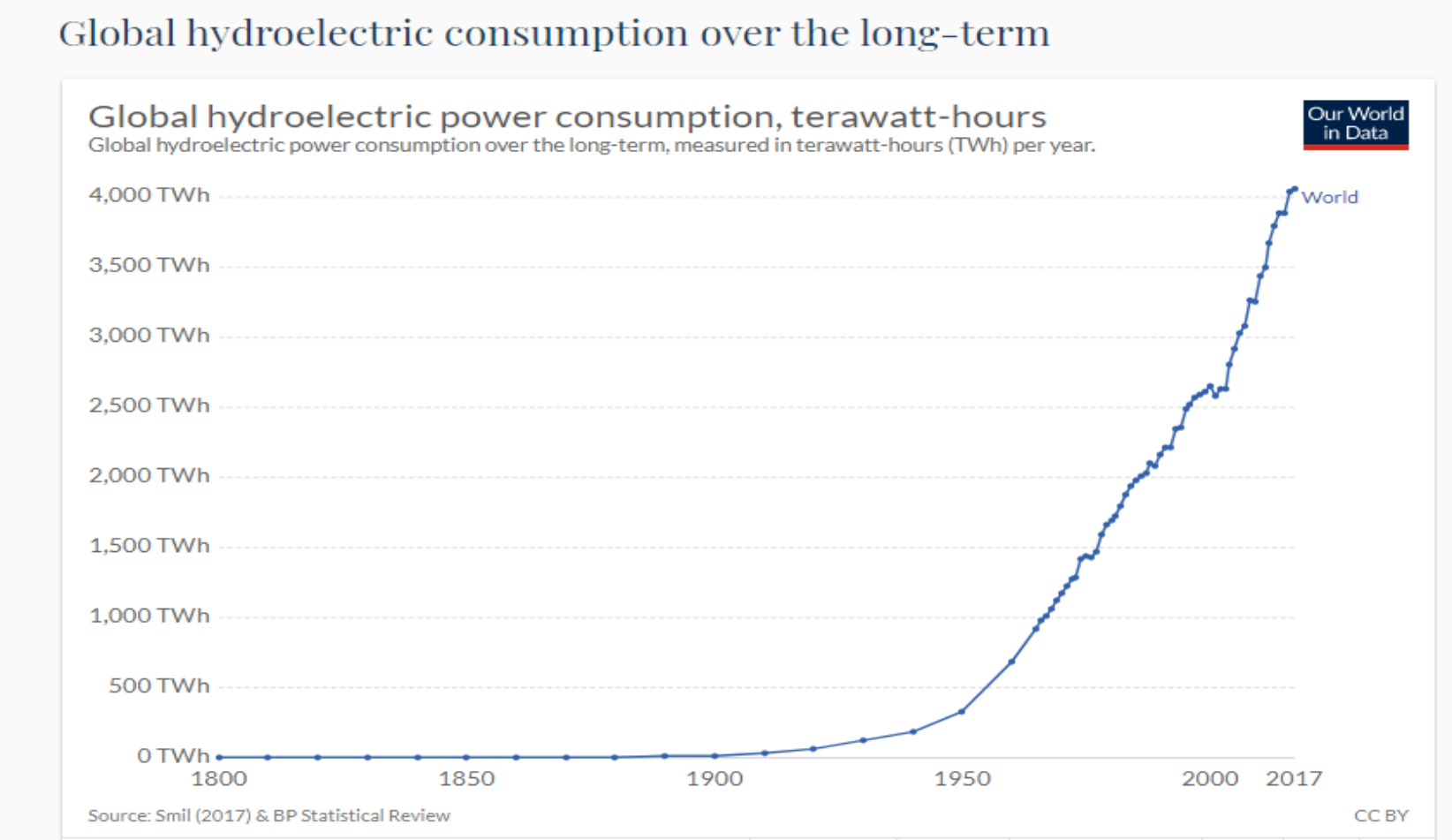


- Renewable energy
- Uses the power of moving water
- **Of the remaining renewable technologies, hydropower remains dominant, accounting for approximately one-quarter of renewable consumption.**
- People have used this force for millennia!

The Three Gorges Dam in China is the largest hydroelectric power plant in the world!

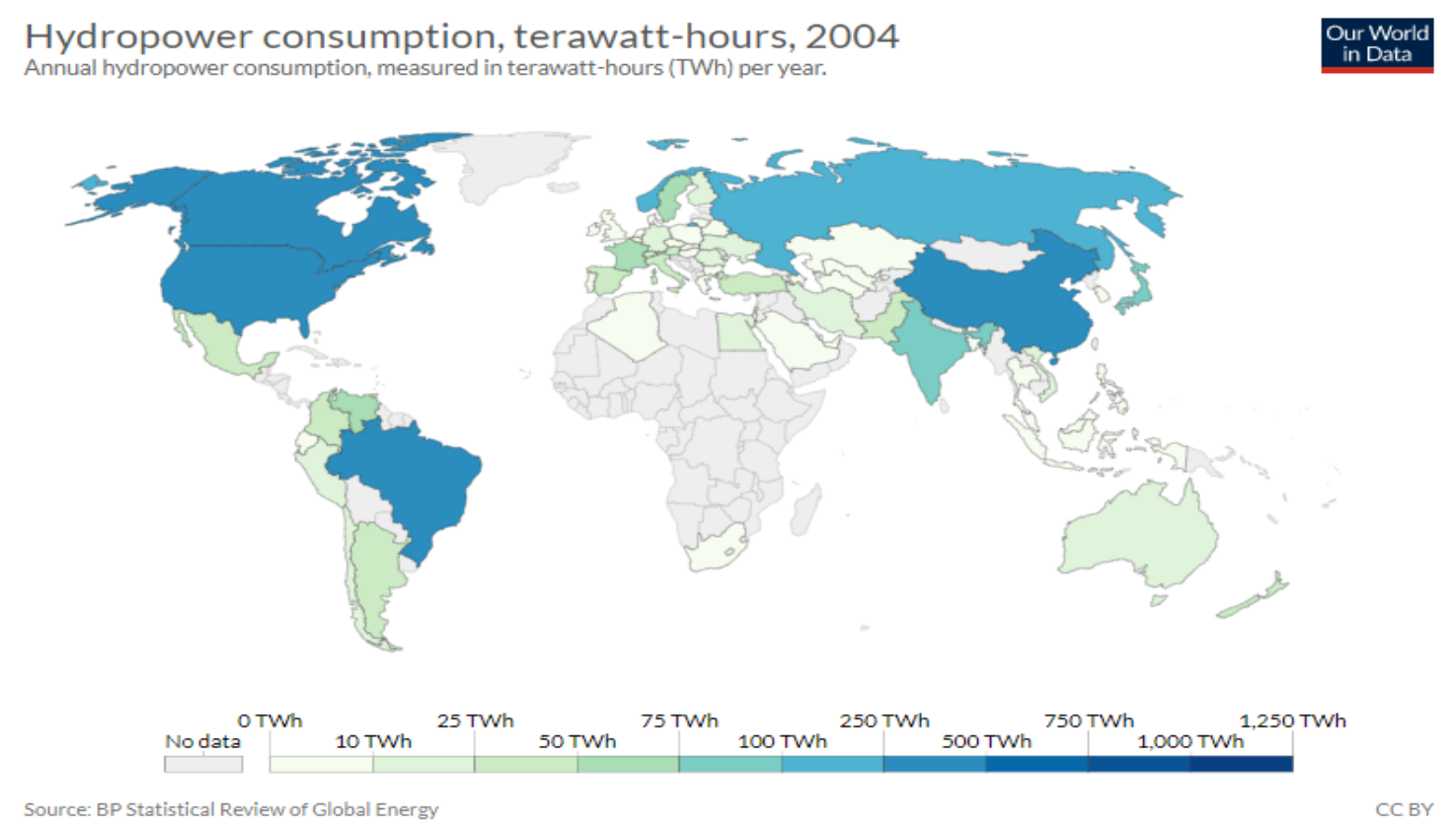
Hydroelectric energy

Global perspective



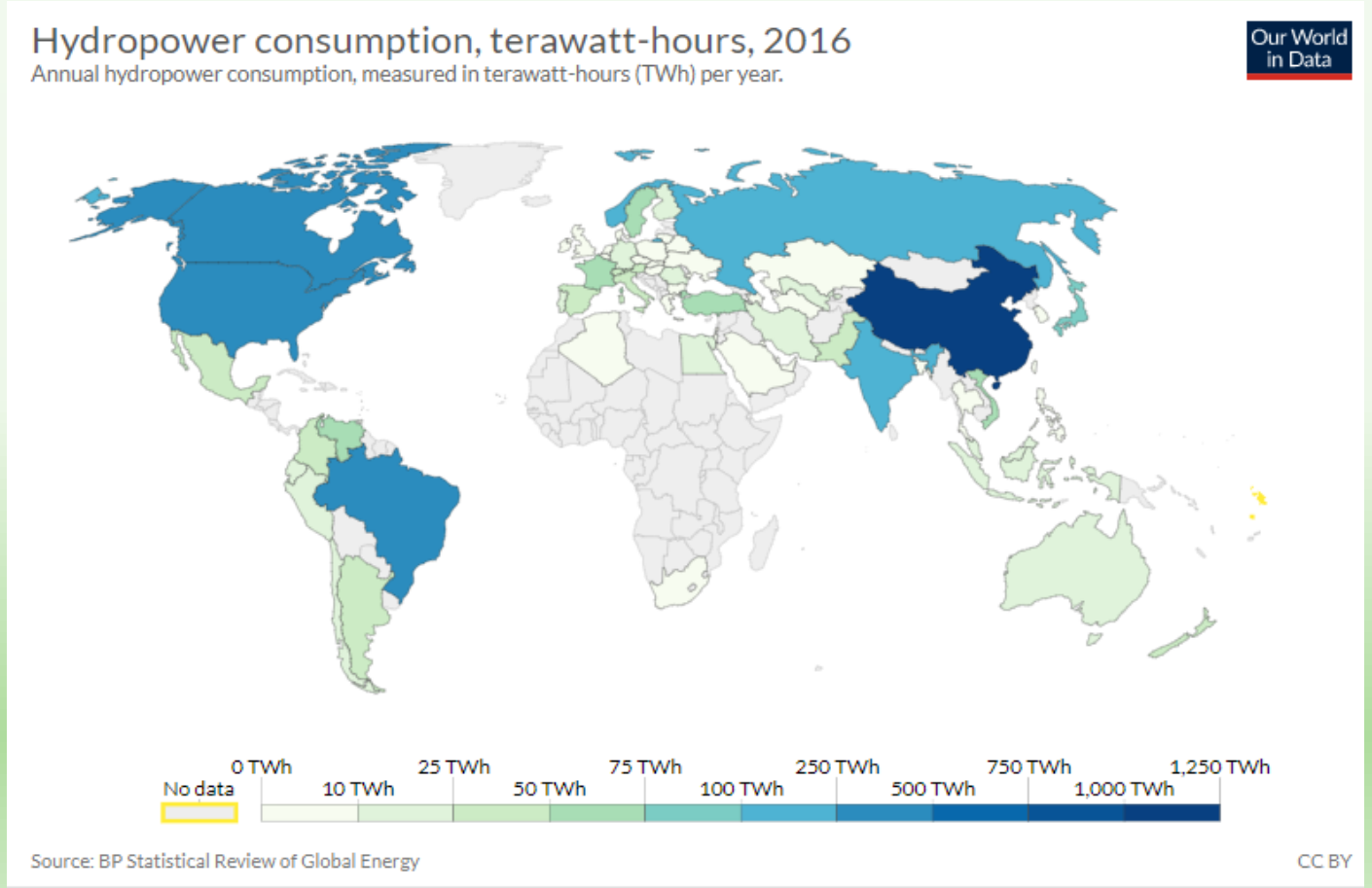
Hydroelectric energy

Global perspective



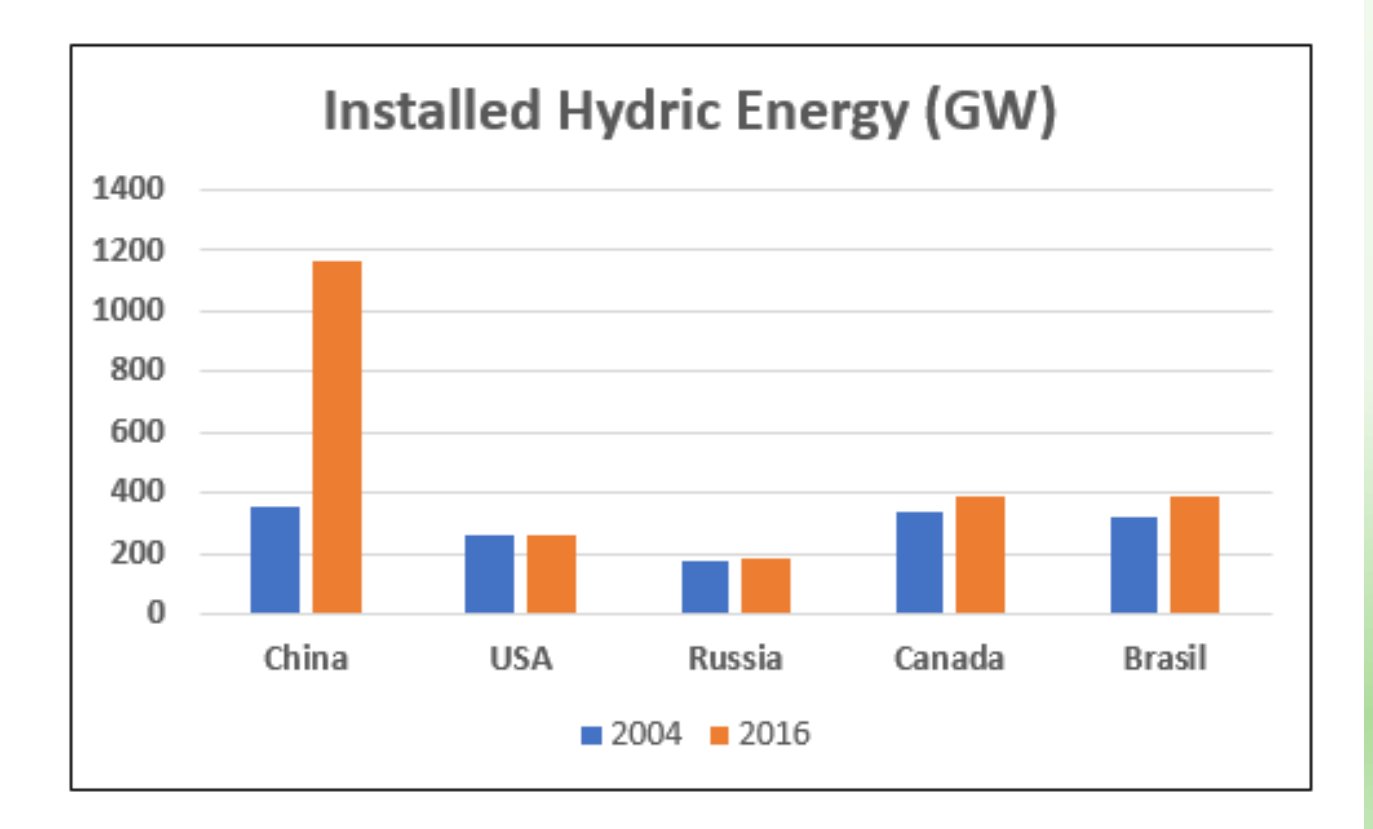
Hydroelectric energy

Global perspective



Hydroelectric energy

Global perspective



Hydroelectric energy

Advantages

- Renewable
- Green
- Reliable
- Flexible
- Safe

Hydroelectric energy

Disadvantages

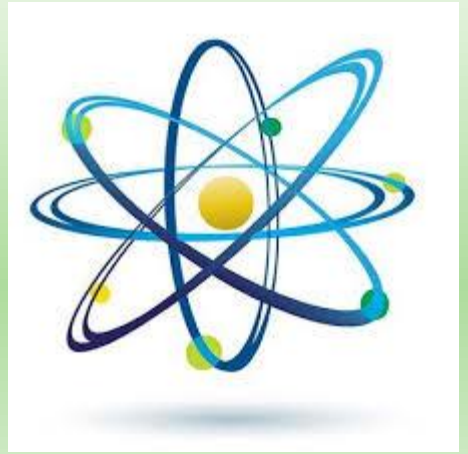
Environmental consequences

Expensive

Droughts

Limited water supply

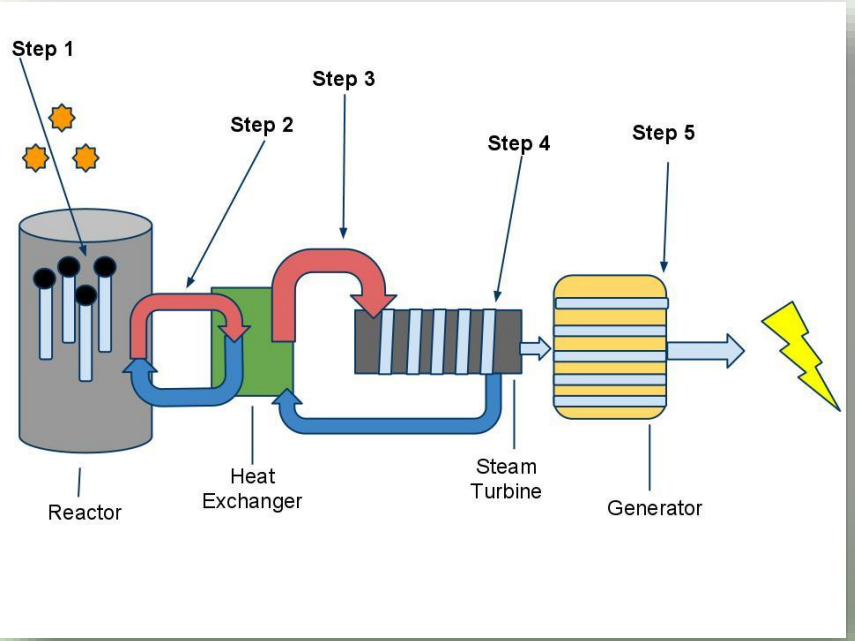
Nuclear Energy



Nuclear energy

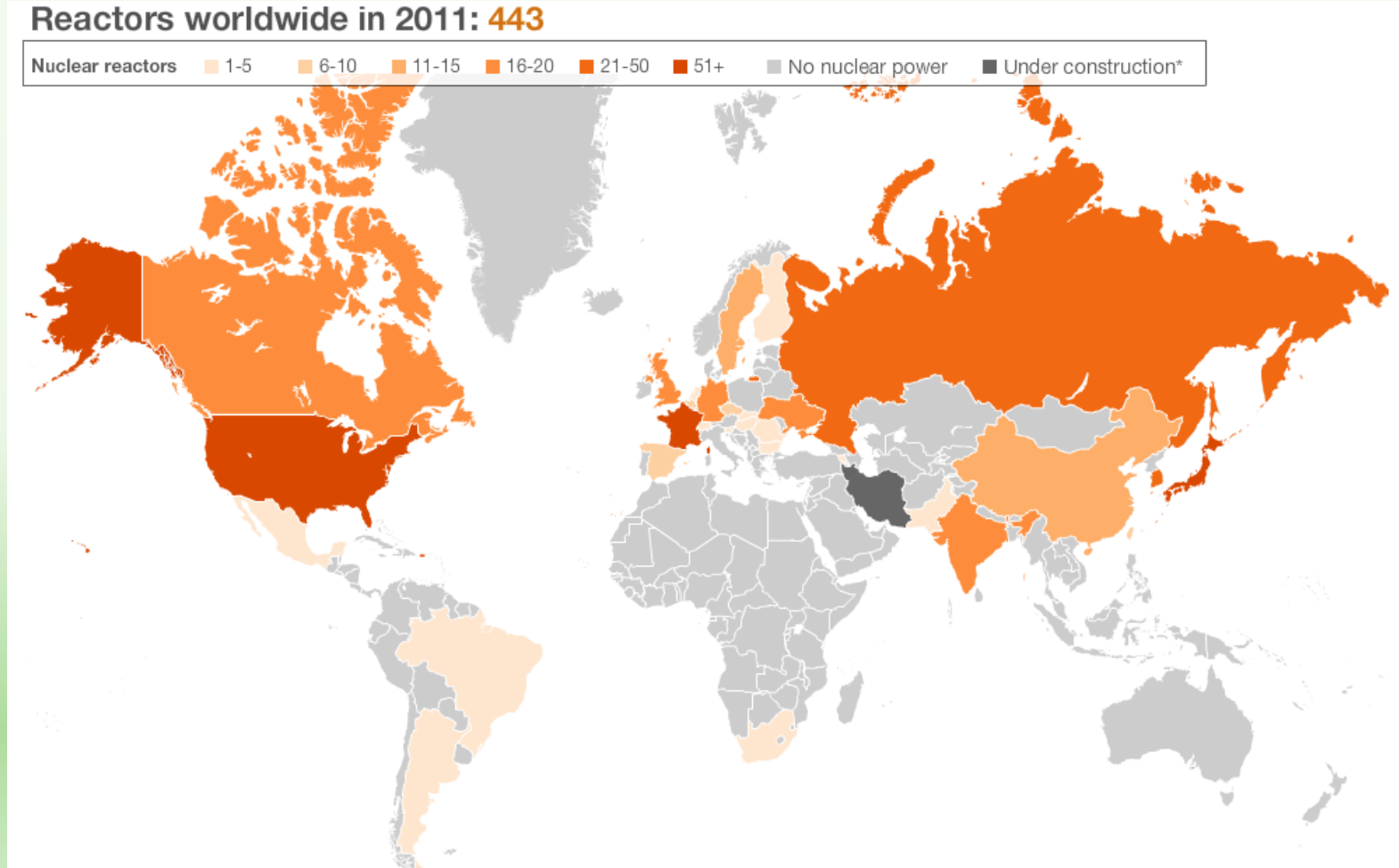
What is it?

- Renewable energy
- Uses the energy released by fissioning and splitting the atoms of uranium
- Provides about 10% of the world's electricity from about 450 power reactors.



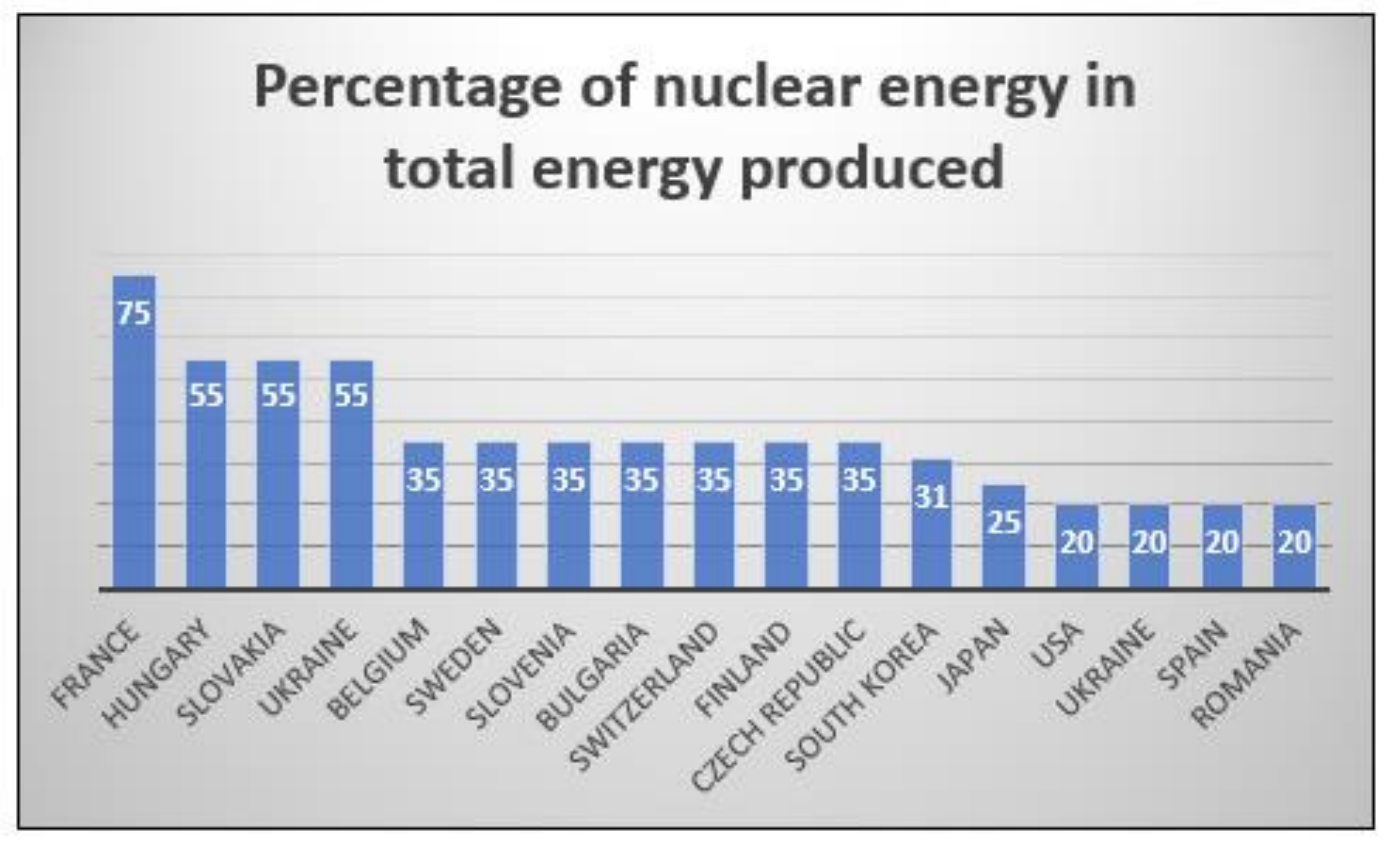
Nuclear energy

Global perspective



Nuclear energy

Global perspective



Nuclear energy

Advantages

- Low pollution
- Low operating costs
- Reliability
- Renewable?

Nuclear energy

Disadvantages

Environmental impact

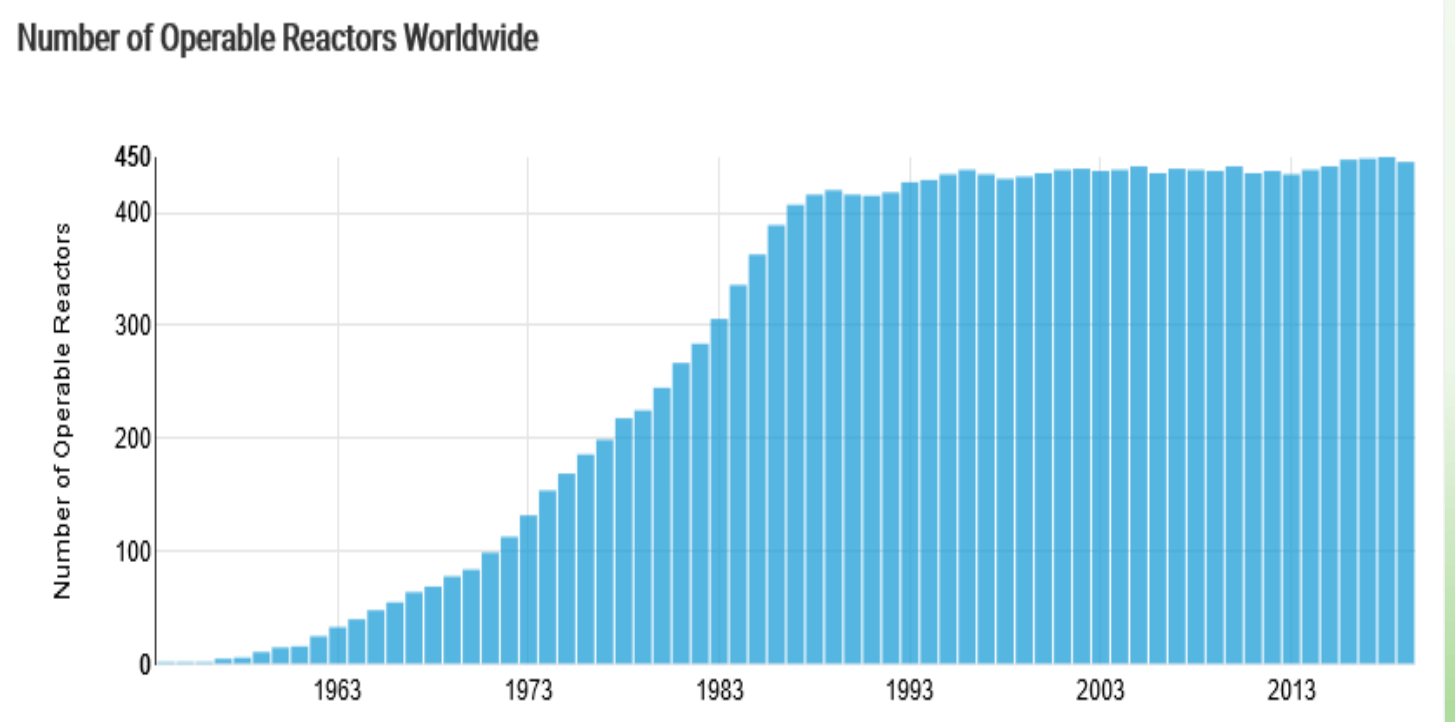
Radioactive waste disposal

Nuclear accidents

High cost

Nuclear energy

Global perspective

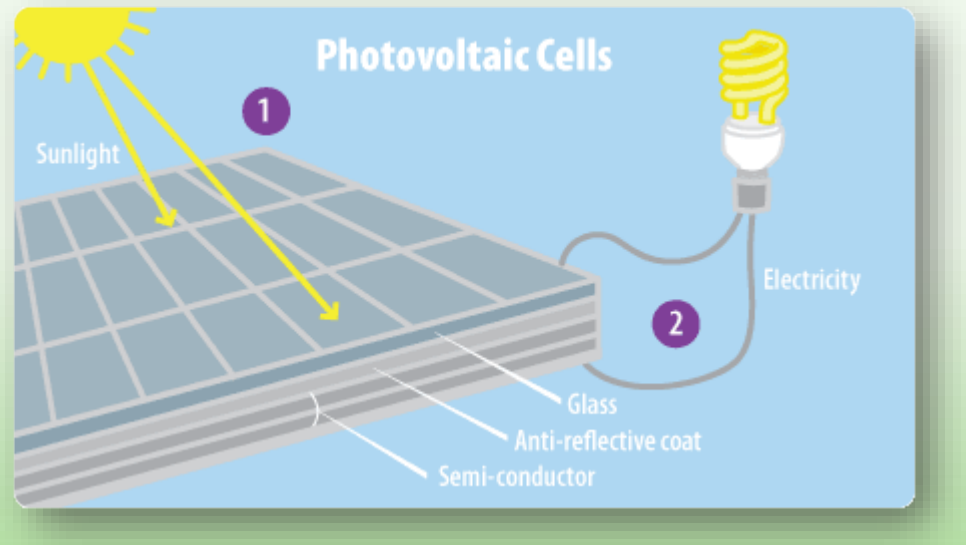


Solar Energy

Solar energy

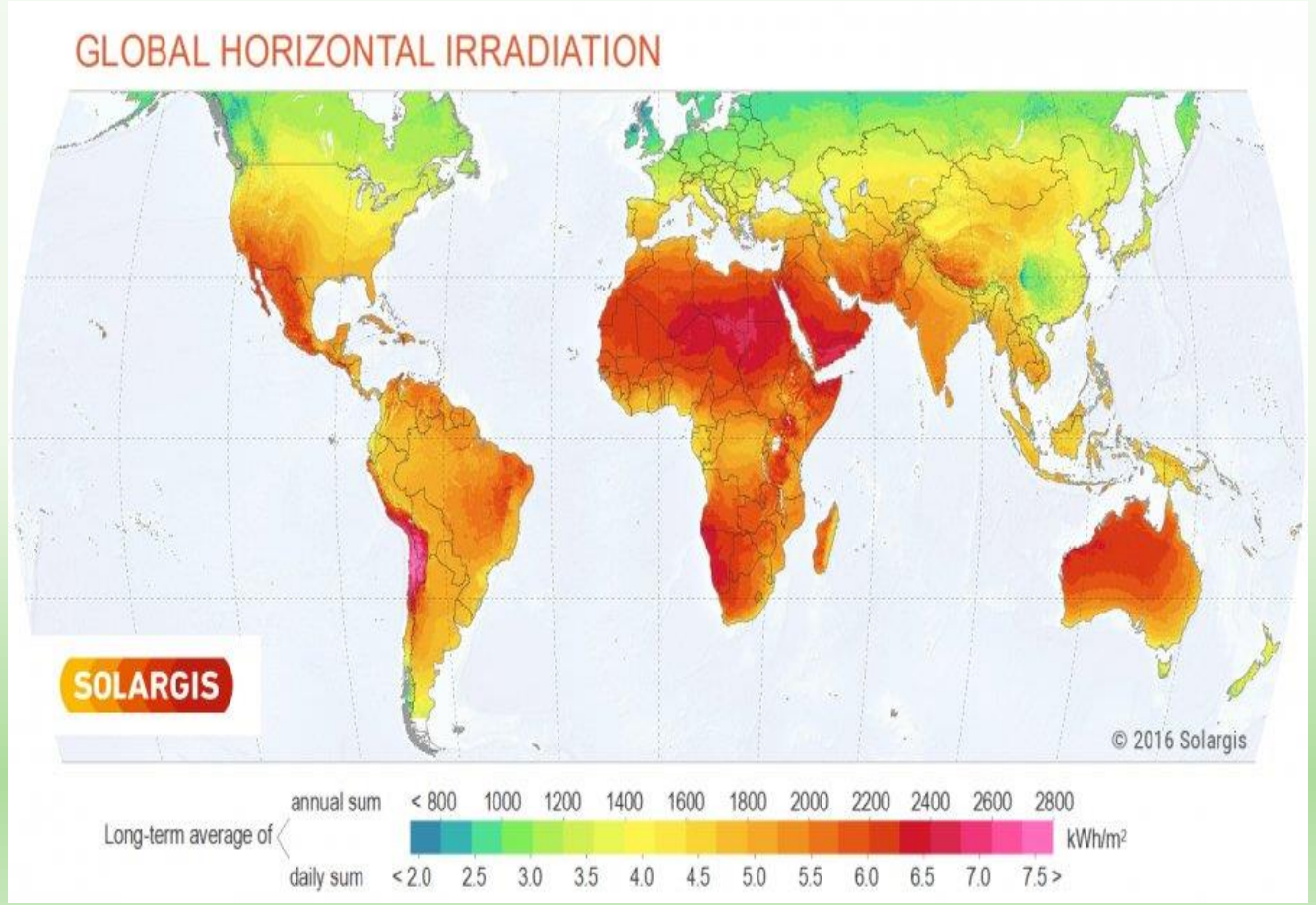
What is it?

- Solar panels convert solar energy into usable electricity through a process known as the photovoltaic effect.



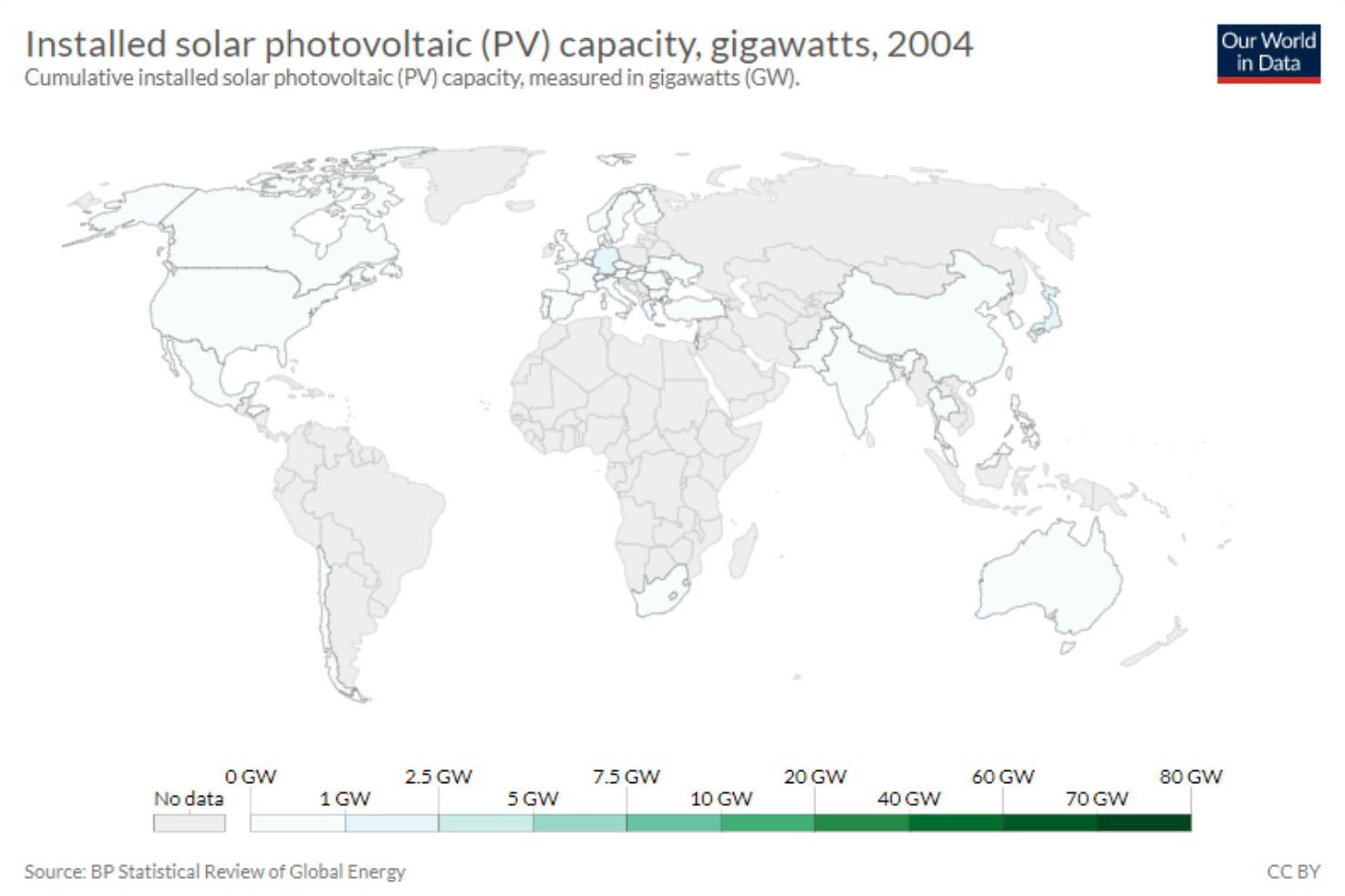
Solar energy

Global perspective



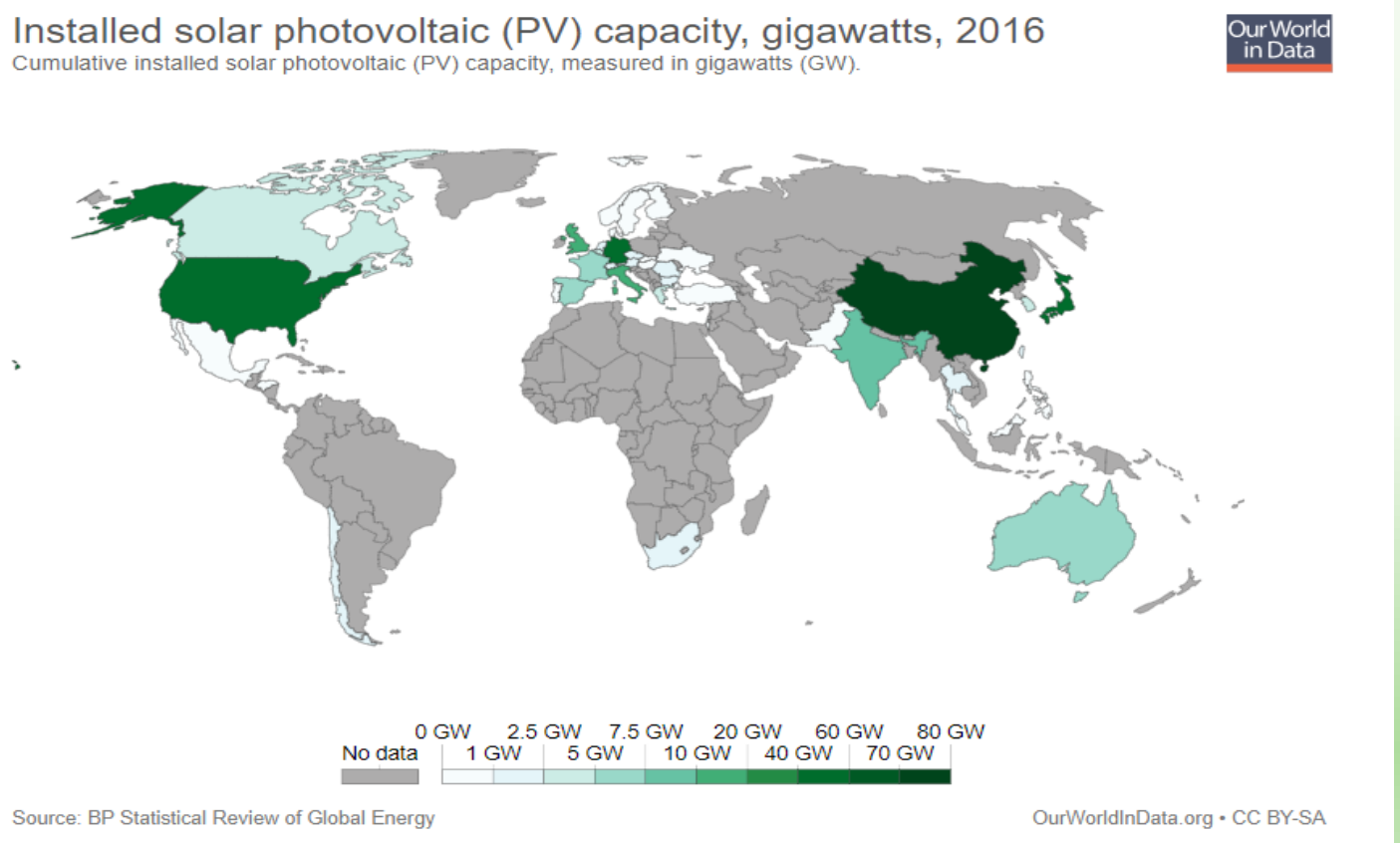
Solar energy

Global perspective



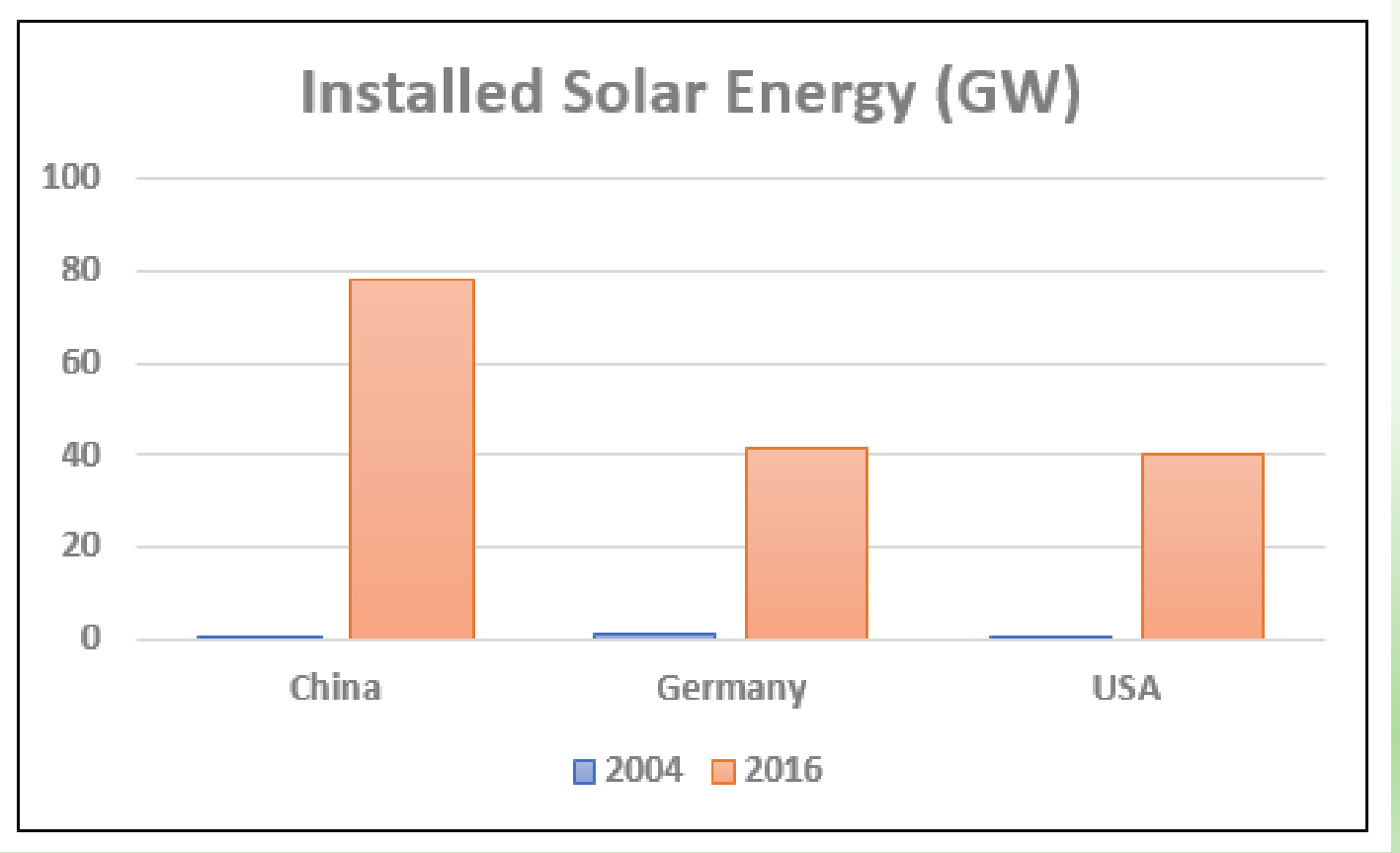
Solar energy

Global perspective



Solar energy

Global perspective



Solar energy

Advantages

- Renewable
- Abundant
- Sustainable
- Good availability

Solar energy

Disadvantages

Expensive

Intermittent

Energy storage is expensive

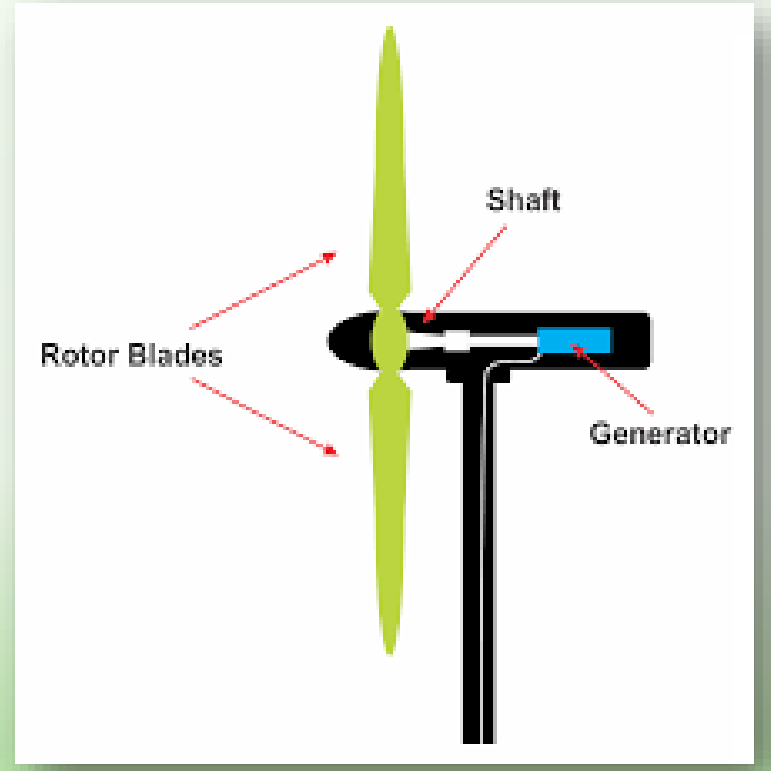
Requires space

Wind Energy

Wind energy

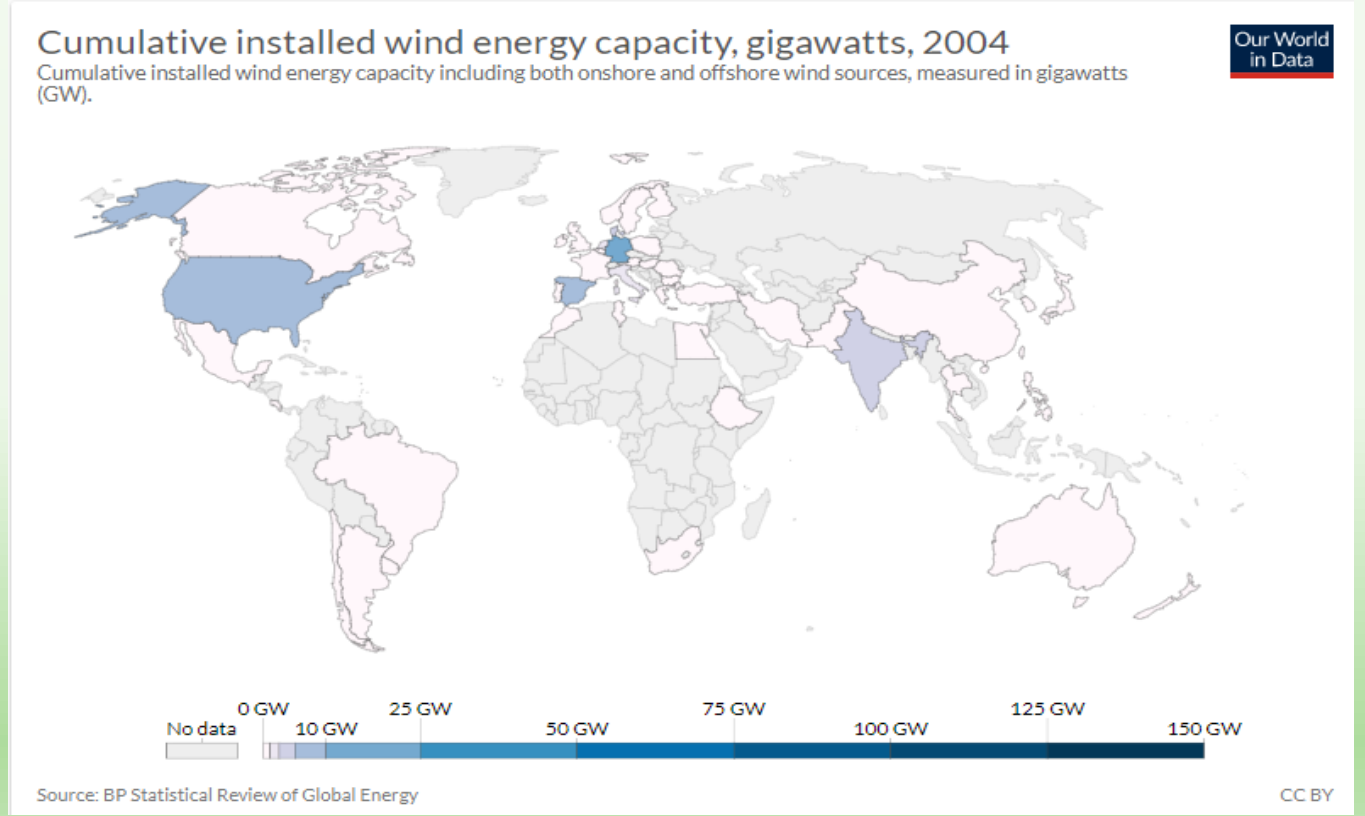
What is it?

- Generates electricity from the wind
- Wind turns the blades of a turbine around a rotor, which spins a generator, which creates electricity



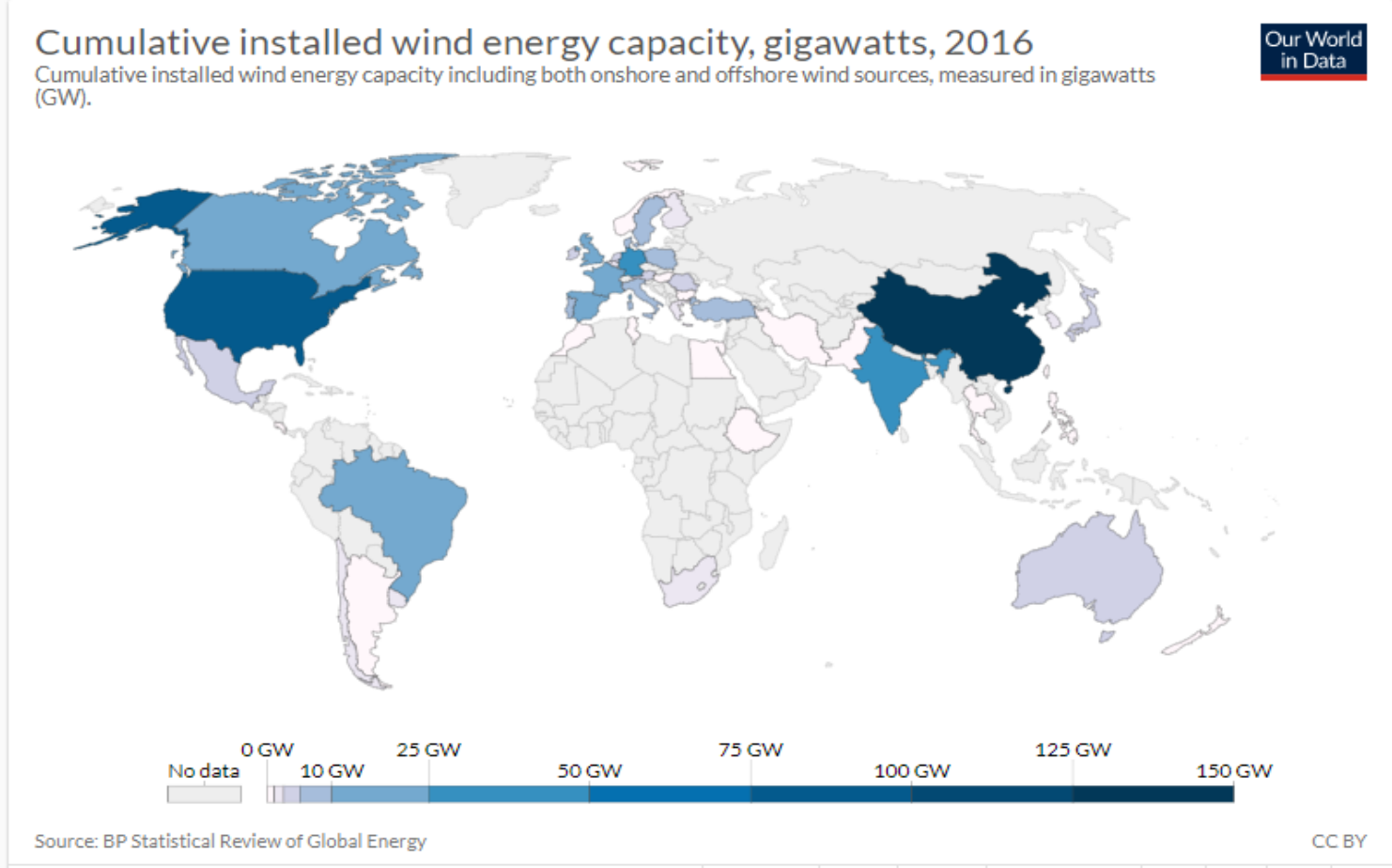
Wind energy

Global perspective



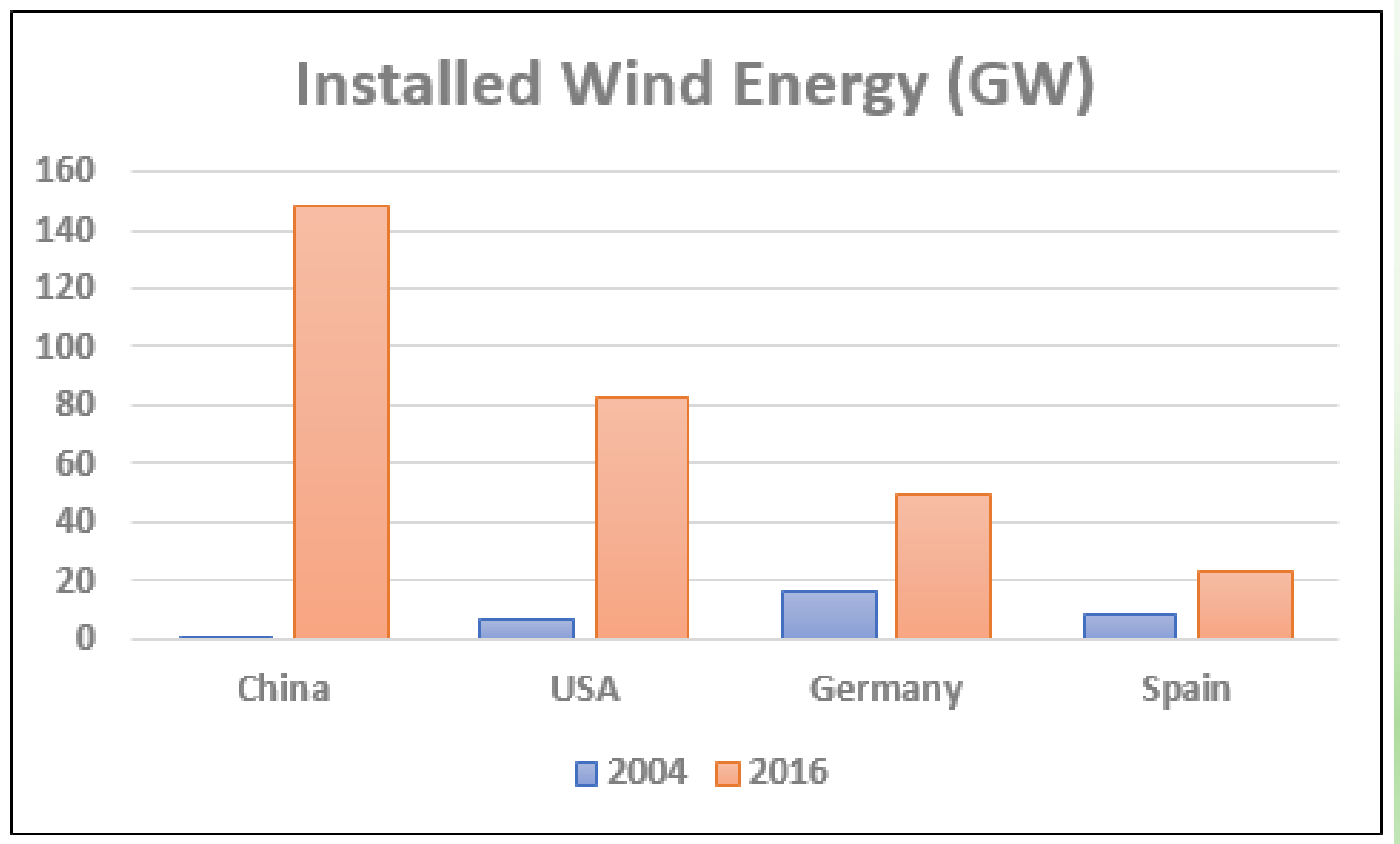
Wind energy

Global perspective



Wind energy

Global perspective

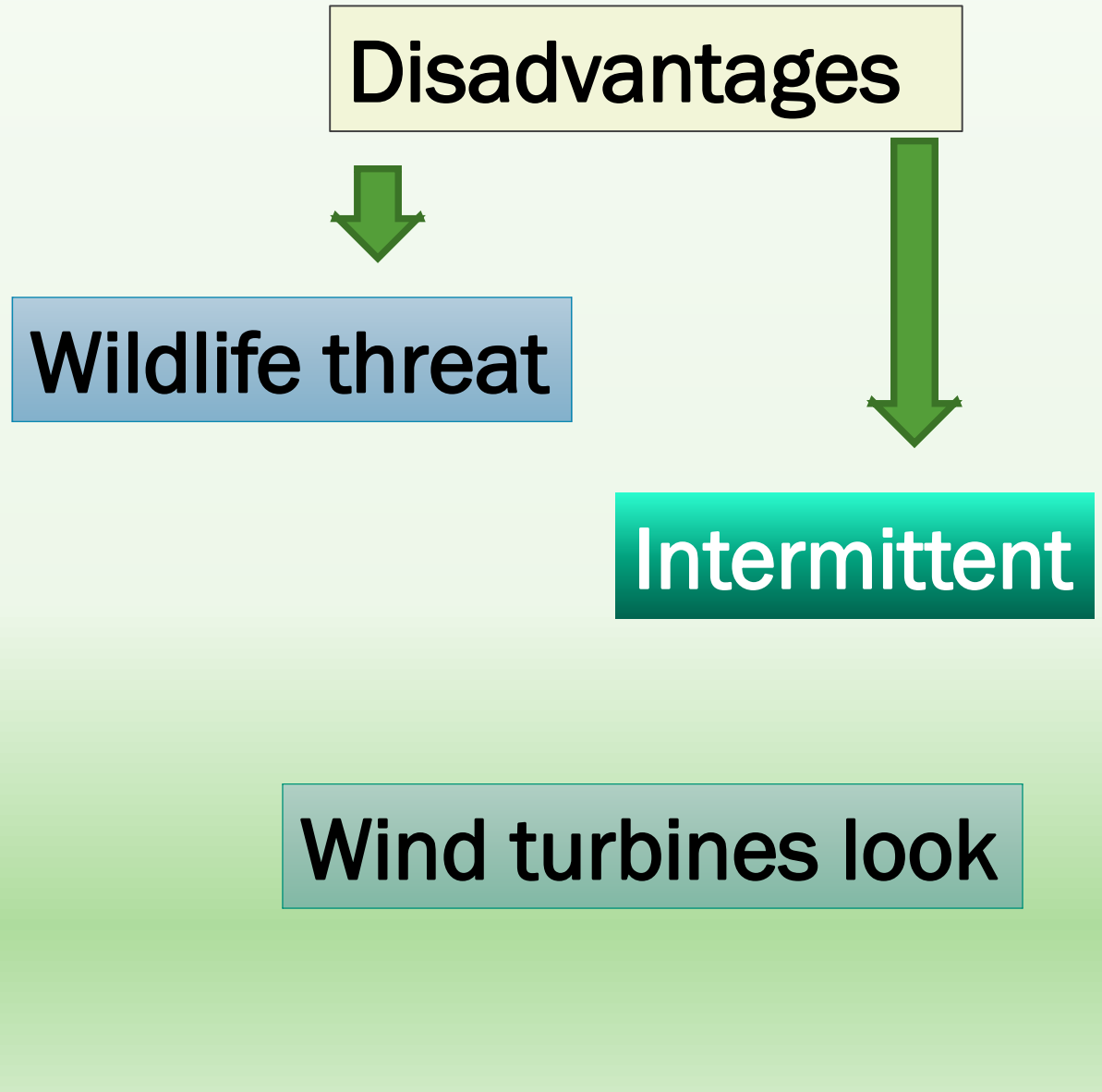


Wind energy

Advantages

- Green
- Potential
- Low cost

Wind energy


Disadvantages
Wildlife threat
Intermittent
Wind turbines look

Colégio
Paulo VI

How can we save energy?

Every day...

- **Take full advantage of natural light and use artificial light only when necessary;**
- **Use of economical lamps;**
- **Switch off the appliances, avoiding standby mode;**
- **Do not leave phone chargers or tablets plugged in;**
- **Opting for more efficient class A+++ air conditioning solutions reduces energy consumption;**
- **Turn off lights whenever leaving a room;**
- **Reuse, reduce and recycle strategy.**

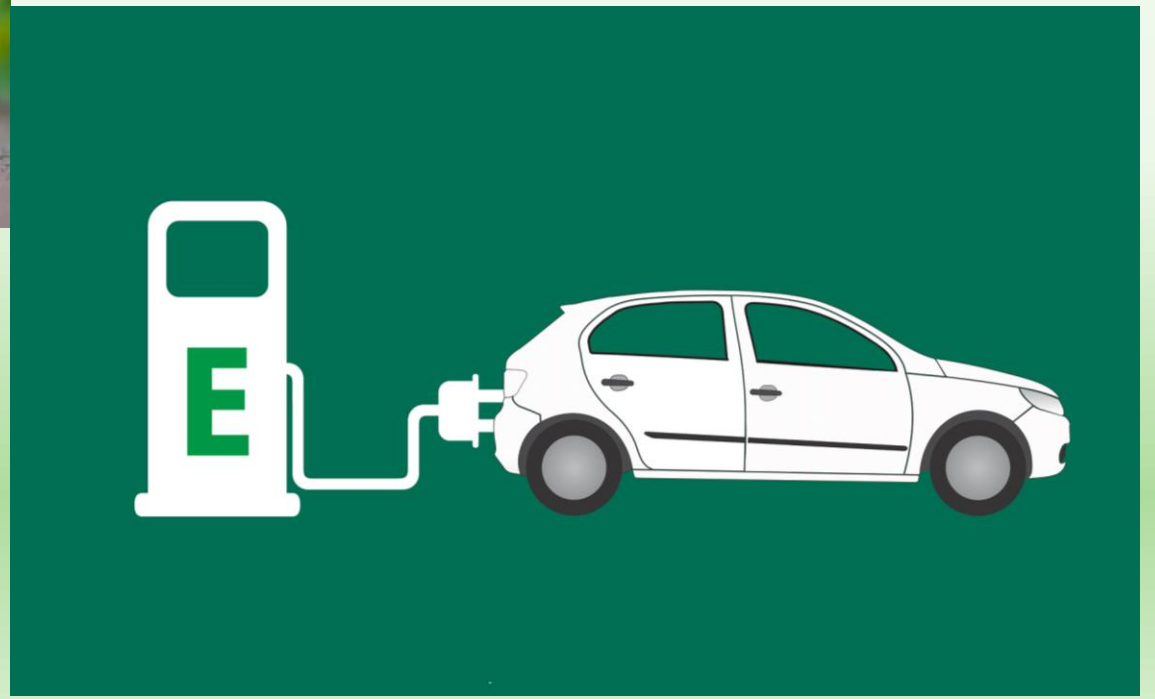
Long-term...

Use of electric cars;

Self sufficient houses;

Green transportation.

Electric cars :



Economical lamps:

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