Electric current

- Charge flow in materials
- Amount of electricity in circuit flow

power

Coal-fired power plant
- 33% eff
Gas-fired power plant
- higher eff(heat source higher temp)
- more environmental friendly
Stream turbine
- convert energy of fluid into mechanical energy by expansion
- stream driven rotary engine

Transformer

use induction
P=VI
Vs/Vp = Ns/Np = Ip/Is
Ns/Np>1 step-up

Voltage

Force or push on electron
Potential difference

AC

frequency 50Hz(direction 100times)
line voltage easily up and down
need larger diameter
cheaper transformation between voltage
easy to off
less equipment, reliable
economical
rotating field

Smart power grid

reliable
- real time info about electricity flow
- identify, correct potential problem before occur
- grid can respond to system and reroute faster power restoration
- can auto know, no need customer call
more info about power usage

Resistance

opposition to current flow

DC

flow in one direction
no skin effect, low loss
need DC-AC converter to control voltage level
switch to high voltage is difficult
long distance, higher power p2p transmission
- lower loss
undersea, underground transmittion
- no reactive power problem
less space

Light

fire 1%, incandescent lamp 3.5% fluorescent lamp 20% LED 80%

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