

Introduction to Solar Energy

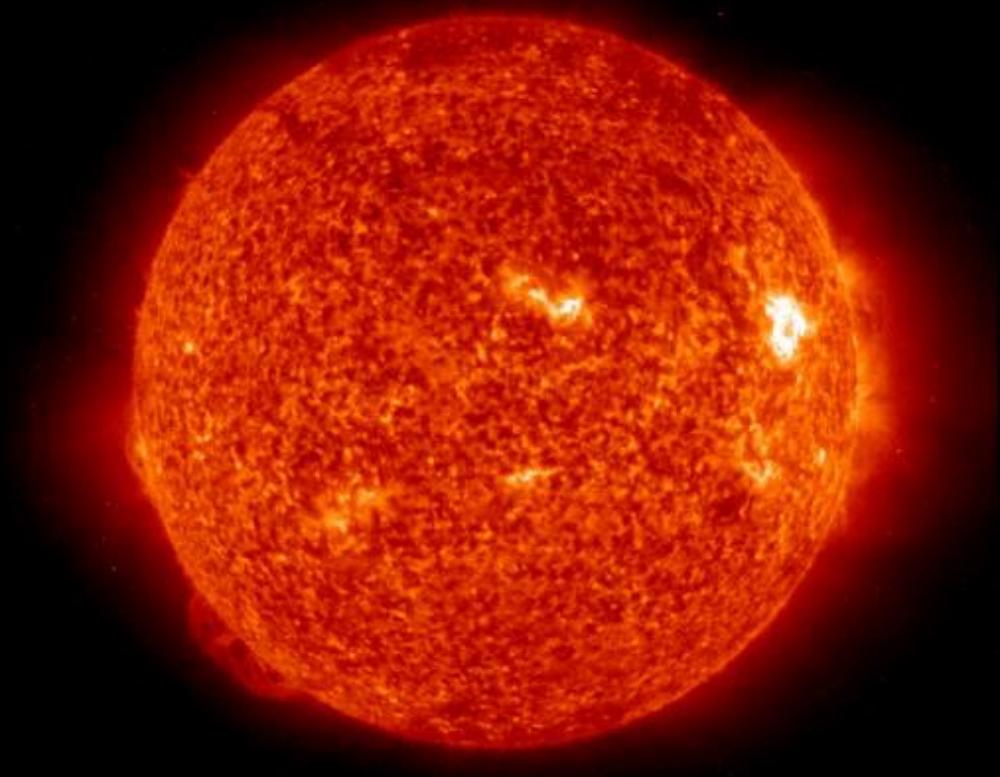
Energy Conversion I

Week 1.2.1

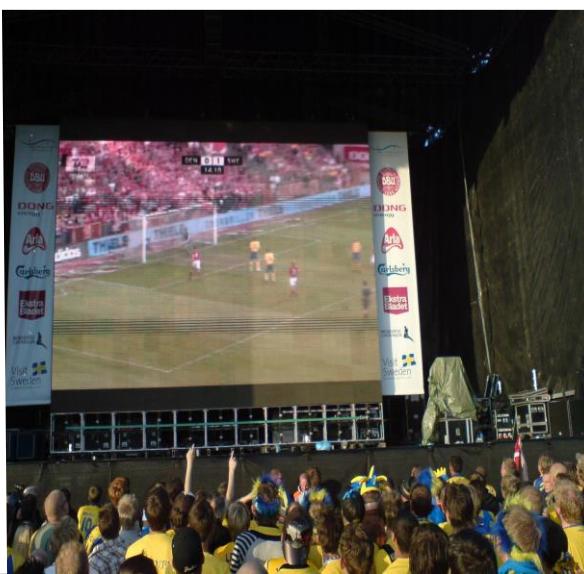
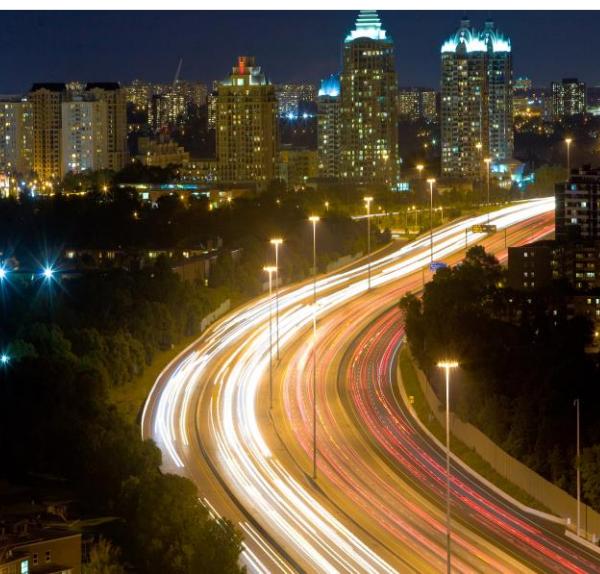
Arno Smets

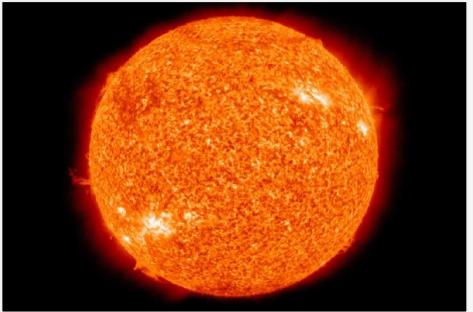
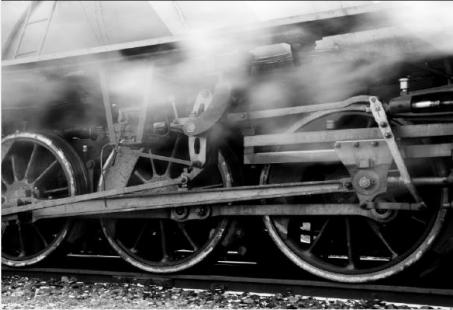


Challenge the future



(Source: NASA)





Energy → Joules (J)

Power = Energy/Time → Watts (W)

$$1 \text{ W} = 1 \text{ J/s}$$

$$1 \text{ kWh} = 1\text{kW} \times 1\text{h} = 3.6 \text{ MJ}$$

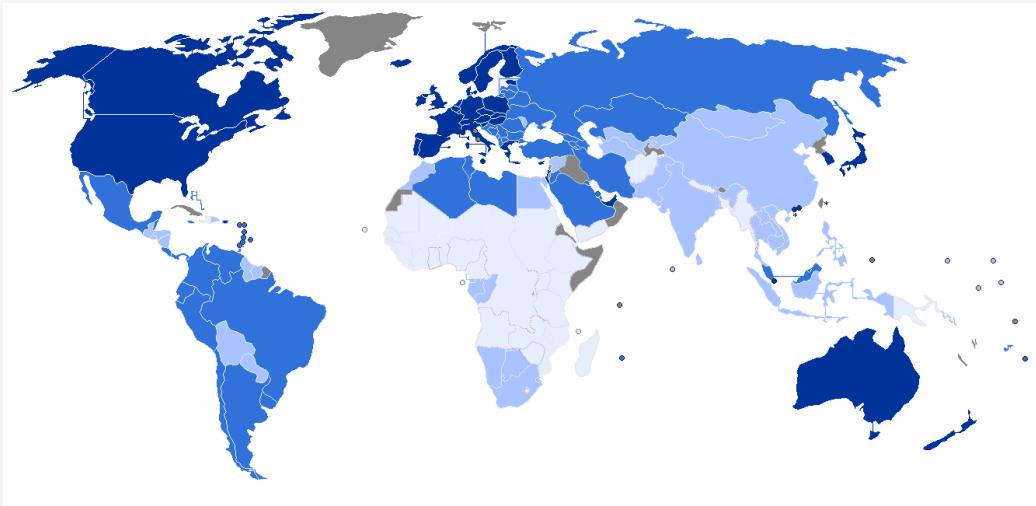
The Energy Problem

Growing world population



The Energy Problem Energy Shortage

Increasing living standard:

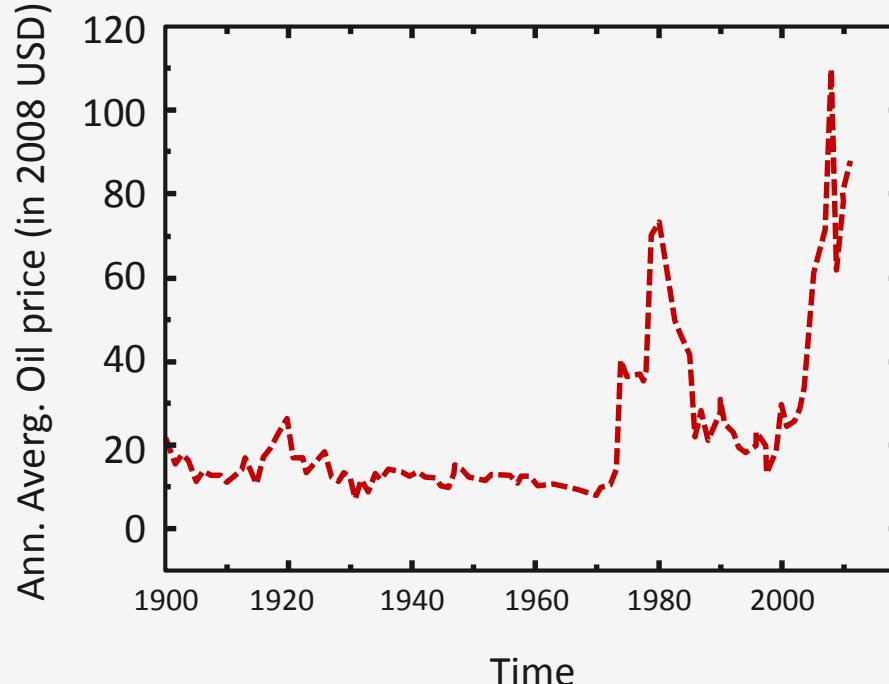


Energy consumption per capita

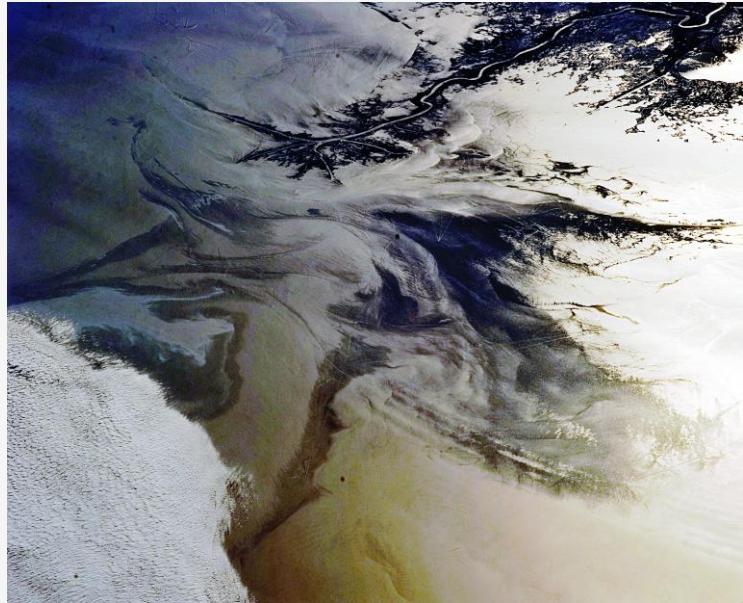
(Source: Wikipedia)

The Energy Problem

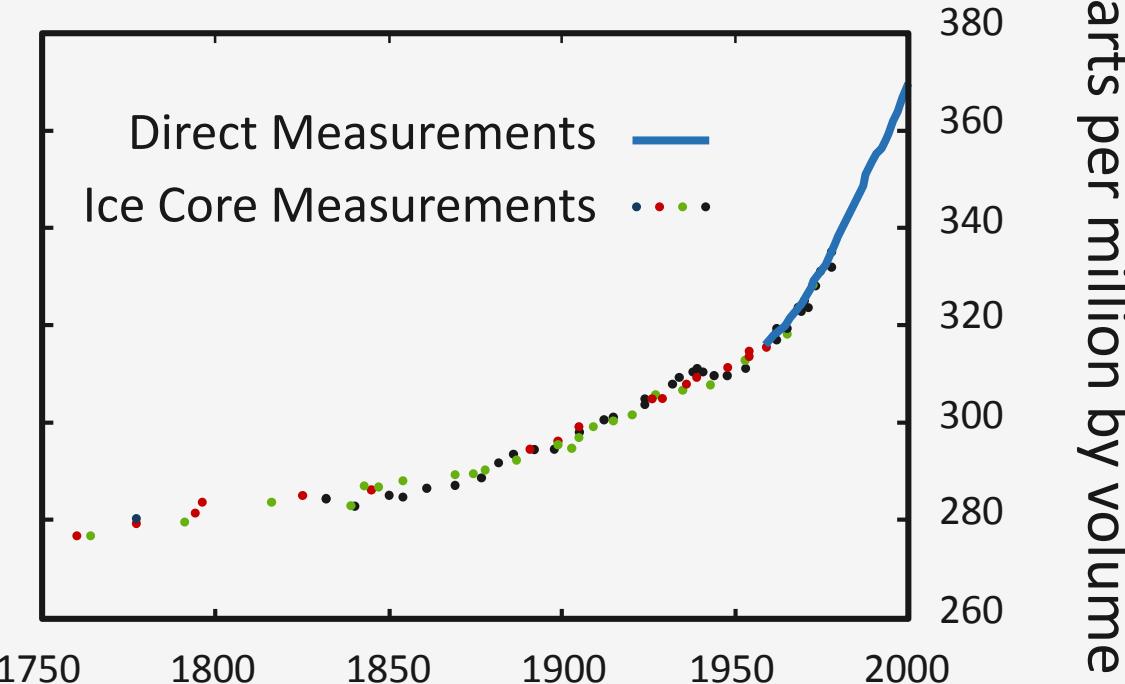
Energy Shortage



Source: BP workbook of historical data



Carbon Dioxide Concentration



Source: Trends in atmospheric CO₂ ESRL-GMD

The Energy Problem

Climate change

