Why use Nuclear Power

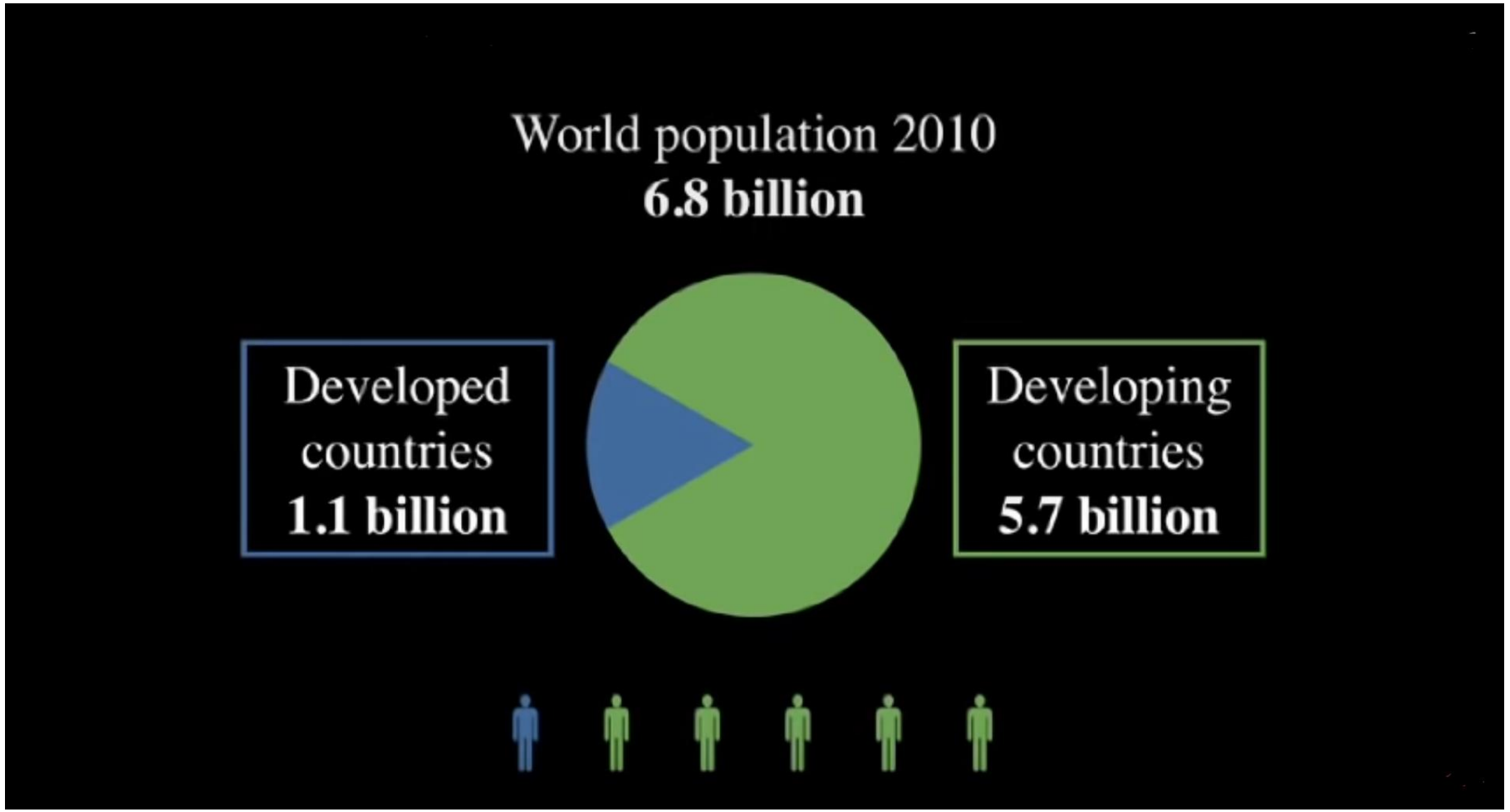
As an energy source

Those in favor raise your hand

The saying is ***With climate*** :

- ***those in climate*** *who know the most are* ***the most worried.***

- ***But with nuclear*** *those who know the most are* ***the least worried.***


World population 2010
6.8 billion
Developed countries
1.1 billion
Developing countries
5.7 billion

Electricity needs

- This is one of the most desired things by poor people all over the world

Electricity sources

- coal
- natural gas
- water
- oil
- nuclear
- Wind
- Solar power

Benefits

- No output of carbon
- Consistent power source
- Less radiation.
- Less harmful.

No output of carbon (global warming)

One day of a 1-gigawatt coal-fired plant uses 80 rail cars of coal

Each coal car weighs 100 tons

The plant generates 19,000 tons of CO_2 (plus vast quantities of slurry and fly ash)

Every day

Spent fuel from one human lifetime's worth of nuclear electricity

Waste

Nuclear waste

1 GW-year = 20 tons = 2 casks

Coal waste

1 GW-year = 8,000,000 tons CO_2

Consistent power source (it is on all the time)

- nuclear power plants operate at much higher capacity factors than renewable energy sources or fossil fuels.
- The sun doesn't always shine, nor the wind always blow, nor water always fall through the turbines of a dam.
- nuclear power plants had an average capacity factor of 92.3 percent meaning 336 out of 365 days per year.
- In contrast, U.S. **hydroelectric systems** delivered power 38.2 percent of the time (**138 days per year**),
- **wind turbines** 34.5 percent of the time **(127 days per year)**
- **solar electricity** arrays only 25.1 percent of the time **(92 days per year)**.

Less harmful

Three-Mile Island in Pennsylvania

- The partial meltdown of the Three-Mile Island reactor in March 1979,
- The approximately 2 million people around the accident are estimated to have received an average radiation dose of only about **1 millirem** above the usual background dose.
- To put this into context, exposure from **a chest X-ray is about 6 millirem**

Chernobyl

- The explosion and subsequent burnout of a large graphite-moderated, water-cooled reactor at Chernobyl in 1986 was easily the worst nuclear accident in history.
- **Twenty-nine disaster relief workers** died of acute radiation exposure in the immediate aftermath of the accident.
- the United Nations Scientific Committee on the Effects of Atomic Radiation, has observed and reported at regular intervals on the health effects of the Chernobyl accident. It has identified no long-term health consequences to populations exposed to Chernobyl fallout except for thyroid cancers in residents of Belarus, Ukraine and western Russia who were children or adolescents at the time of the accident, **who drank milk contaminated with 131iodine, and who were not evacuated.**

Other industrial accidents

- To name only two:
- **Bhopal,** in India, where at least 3,800 people died immediately and many thousands more were sickened when 40 tons of methyl isocyanate gas leaked from a pesticide plant
- **Henan**, in China, where at least 26,000 people drowned following the failure of a major hydroelectric dam in a typhoon.

To summarize