

The Role of Nuclear Energy in India's Future with Regards to CO₂ Emissions

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Nuclear Energy and Weapons in India

- Research - 1960 (AECL), power plants - 1969 (NPCIL 2010)
- Originally from USA and Canada (Colors of India)
- Operation Smiling Buddha - 1974 (NWA)
- CANDU model for domestic PHWRs (Bajaj and Gore)

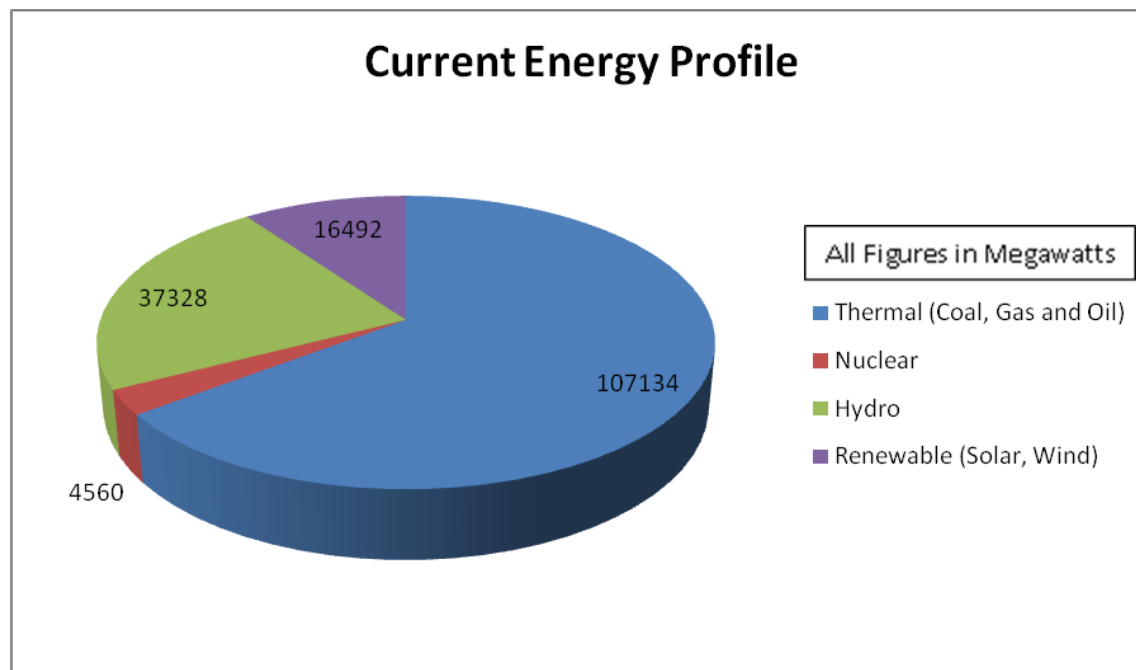


Nuclear Energy and Weapons in India

- NPCIL - September 1987 (NPCIL 2010)
- Has not signed NPT (Godsberg)
- 2.8% of electricity generation in 2010 (CEA)
- 164.8 GW generated (CEA)
- 1.6 billion tons of CO₂ (UNSD 2010)

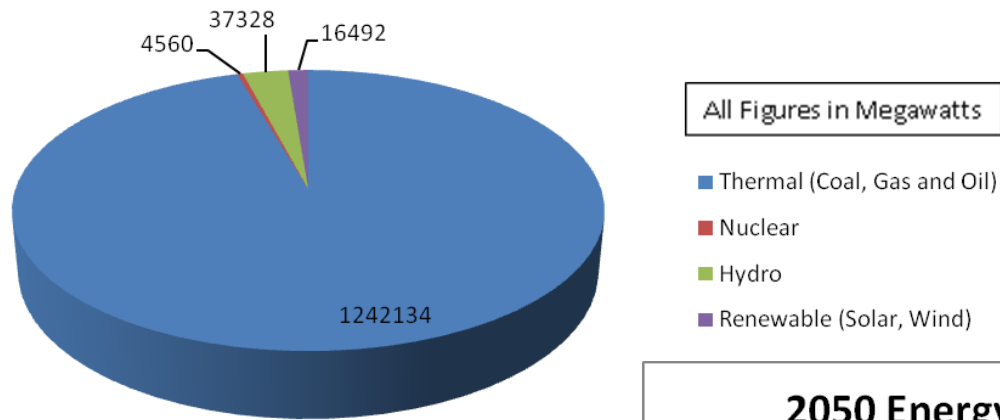
Energy and CO₂ Emissions in India

- Increasing energy demand (Lomax 2010)
- Energy consumption to rise 800% to 1,300 GW by 2050 (Rajesh 2010)

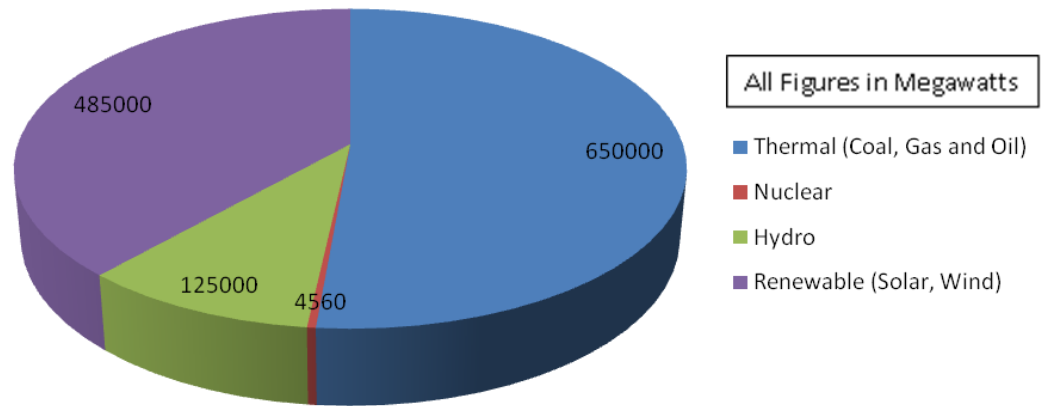


Energy and CO₂ Emissions in India

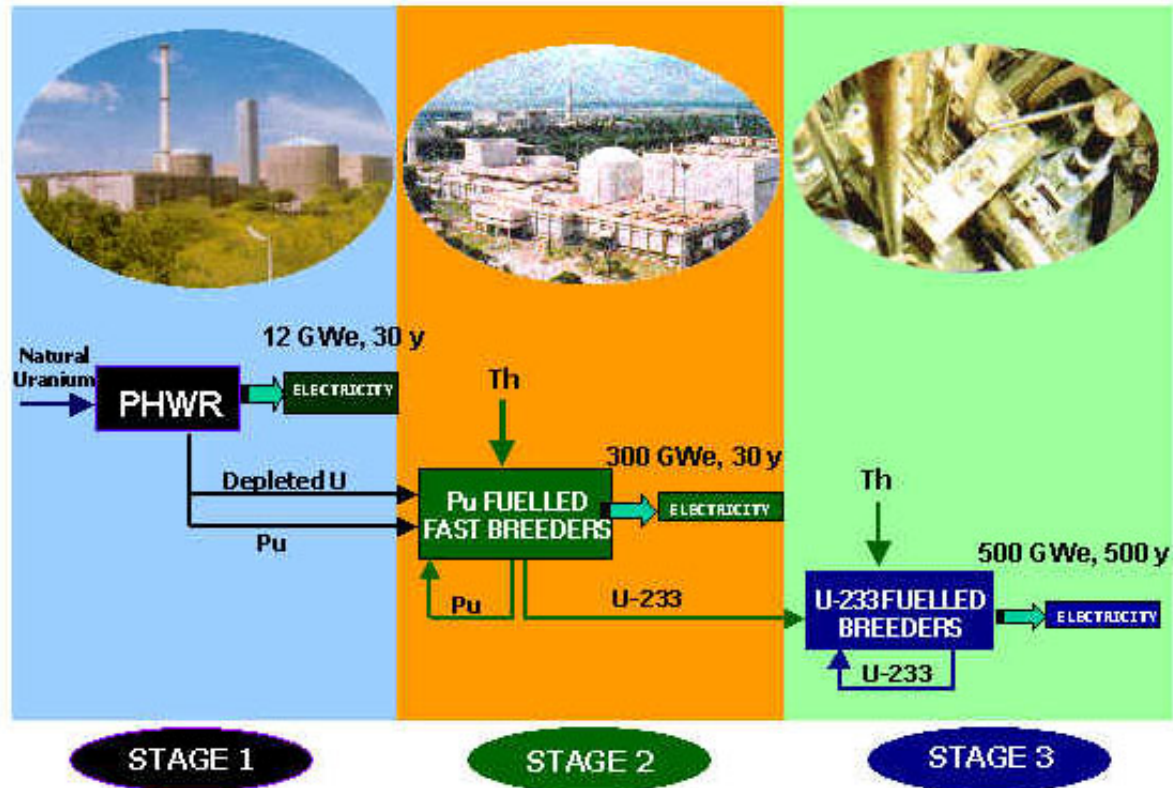
2050 Energy Profile: Only Coal Expansion



2050 Energy Profile: No Nuclear Expansion



India's Three-Stage Nuclear Plan



- Poorly endowed with Uranium, well endowed with Thorium (Dadhich et al. 2010)
- AHRWs as an alternate route to Thorium use (Dadhich et al. 2010)

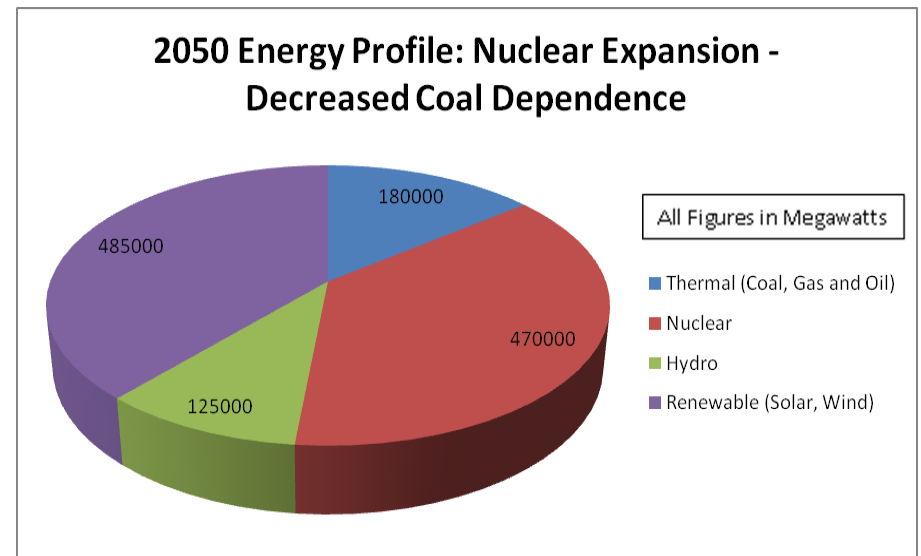


Implications to CO₂ Emission Reduction

- 123 agreement
- Civil Liability for Nuclear Damages Bill of 2010
- Target: 50% CO₂ reduction on 1990 levels by 2050
- Would mean reducing emissions to 0.494 billion metric tons by 2050 (Sharma et al. 2006) - one third of current emissions

Nuclear Energy as a Baseline

- Projected energy deficit of 400GW can be completely eliminated (Rajesh 2010)
- Current ambitions: 470GW from nuclear by 2050 - 11,000% increase (Neuhof 2010)
- 6% of capacity by 2016 (NPCIL)





Additional Information

- 75% of France's energy comes from nuclear (WNA 2010)
- Attributed to France's very low CO₂ emissions and world's largest net exporter of energy (WNA 2010)
- July 1, 2010 - MoEF "India: Taking On Climate Change - Post-Copenhagen Domestic Actions."



Concluding Remarks

- 123 agreement will facilitate the development of the Three-Stage Programme
- Cost-effective policy
- Start of a global effort
- Successful legislation at domestic, multiple bi-lateral and international levels