

# GREEN COMPUTING



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# GREEN COMPUTING



- **Green Computing**, is the movement towards a more environmentally sustainable computing or IT, through the study and practice of efficient and eco-friendly computing concepts.
- The biggest challenge facing the environment today is global warming, caused by carbon emissions. About 98 percent of CO<sub>2</sub> can be directly attributed to energy consumption, according to a report by the Energy Information Administration.





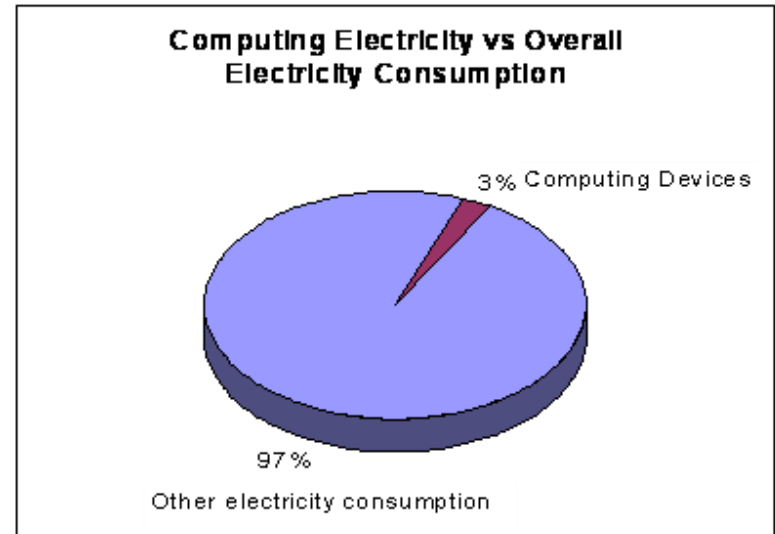
# CO<sub>2</sub> Emission





# What should an energy-aware planet know about computing?

- Energy consumed due to various information and computing (ICT) technologies
  - Useful to know what percent of global consumption, and comparison to other sectors
- Amount of CO2 emissions from ICT
  - Useful to know what percent of global emissions, and comparison to other sectors



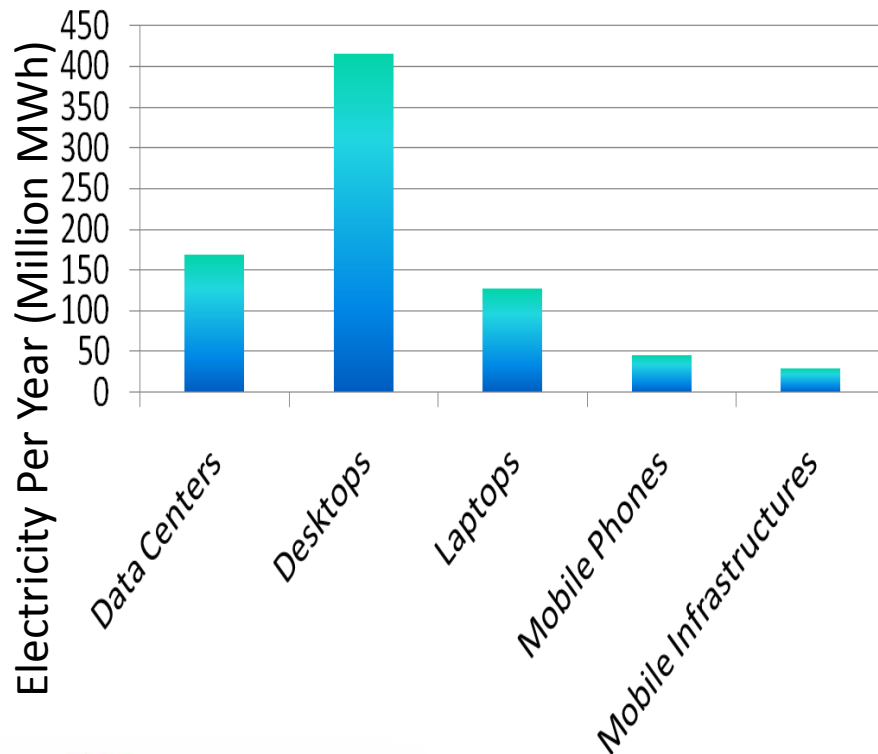
Considering the Worsening Climatic Situation of the Earth, this is still a significant amount and hence the computation sector requires more concerted efforts to reduce these numbers!



# Targeted Area



# Personal Computing Energy



- Desktops consume 60W as opposed to 35W for a Laptop.
- Data centers are fast becoming a major source of global energy consumption. Around 50% of the World's Data centers in the U.S!!





# Environmental Impact – CO2

- Electricity consumption only 12% of global energy consumption
  - Personal computing consumes only 0.31% of global energy
- Electricity consumption responsible for 40% of global CO2 emissions
  - Personal computing responsible for 1% of global emissions
  - Coal, a major source of electricity generation
  - Equivalent to emissions by 4.5 million vehicles driving 10,000 miles per year with average mpg of 21.
- Thus computing responsible for a larger share of emissions than what is expected based on share of global energy consumption



# Life Cycle of a Personal Computing Device



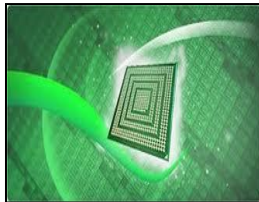
USAGE



RECYCLE

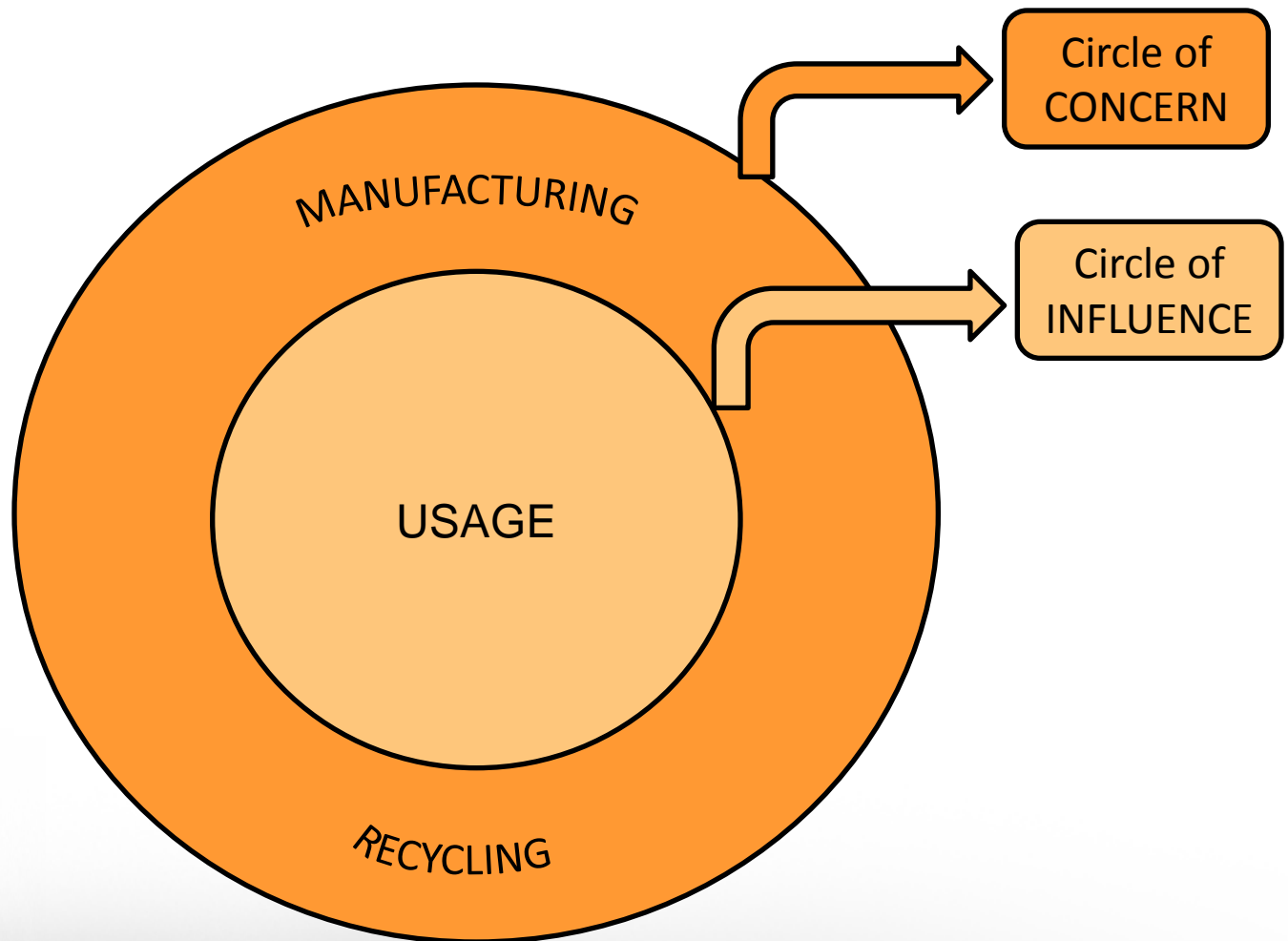


MANUFACTURE





# Circle Of Influence-What can we do?



# Circle Of Influence-What can we do?

- Turn off the computer when not in use, even if it is just for an hour
- Turn off the monitor when not in use rather than opting a Screen saver
- Use power saver mode
- Switch off Wi-Fi when not in use
- Don't print unless necessary
- Upgrade rather than replace
- Use hardware/software with the Energy Star label
  - Energy Star is a “seal of approval” by the Energy Star organization of the government (the EPA)



# Energy Harvesting



**Solar Energy Generation**



**Solar Phone**



**Solar Panels**



# Go Green!!

- Employ Power Management
- Improve Battery Management
- Adjust Optimization Metrics
- Utilize Energy Harvesting



**“GO GREEN” WITH GREEN IT COMPUTING!!**  
**HELP SAVE THE ENVIRONMENT, SAVE YOURSELF SOME MONEY.**