

# 15 ways Software Developers Can Slow Climate Change

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## BACKGROUND: ELECTRIC PRODUCTION

- Overall electric generation has not changed much over the last 30 years.
- The majority of large scale, grid level, electric generation is thermal based (steam turbine) technology, derived from fossil fuel sources (coal, oil, gas) which is on average between 33 -37% efficient, based upon fuel BTU energy input and BTU equivalent content of electric energy output.
- Ironically, since it doesn't increase greenhouse gas emissions, nuclear power is, in some circles, now being repackaged and considered a "green" technology (that is if you ignore the mining of the uranium, the unresolved issue of radioactive waste, terrorism prospects, and the heating up of local ecosystems).
- Alternate fuel sources (solar, wind, hydro, geo-thermal, tidal, etc.) are promising but are generally limited to specific geographic regions and intermittent in nature (not an on-demand resource).
- Transmission and distribution losses are another 7%
- Another percentage is lost by the equipment finally connected.
- Therefore, overall efficiencies are in mid-to-upper 20% range.
- Biomass (especially gasification) and solar/hydrogen based technologies offer the best long-term sustainable, carbon neutral energy sources.
- Overall, electricity is a highly refined source of energy and should be reserved for specialized uses and as sparingly as possible.

## **ELECTRIC ENERGY USE REDUCTION**

- 1) Get an energy audit from Efficiency Vermont
- 2) Don't use grid based electricity for anything that some other power source can also accomplish (heating, cooling, transportation).
- 3) Replace all incandescent light bulbs with fluorescent. Replace all older fluorescent fixtures with newer generation types. Install occupancy sensors or daylight sensors where natural light prevails.
- 4) Work in the dark (use task lighting).
- 5) Develop software to help progress consumer awareness of energy use and viable alternates (power monitoring for home or office / solar monitoring for application of solar technologies).

## **DATA PROTECTION & INTEGRITY**

- 1) Provide UPS protection for all critical electronic equipment.
- 2) Provide generator back-up for long term outages (can be green-fuel based).
- 3) Provide surge protection for your local electrical system.
- 4) Check for proper grounding of data network infrastructure and electrical system (single point of grounding for both systems).
- 5) Ideally, provide redundancy to all data network components (no single point of failure topology).

## **PRODUCTIVITY**

- 1) Provide broadband capabilities to all employees, at work and at home. Be flexible with employees to use this infrastructure.
- 2) Support Vermont broadband initiatives.
- 3) Install as advanced an infrastructure technology as can be afforded at any given time, especially cabling systems.
- 4) Use virtual web-based technologies where possible, such as J2 Connect for FAX services or develop/use web-based application systems and products.
- 5) **Be successful** and engage as many local based businesses and services as possible in the operation of your company and product. Sharing success helps all succeed.