



#### Abrupt Climate Change Risks

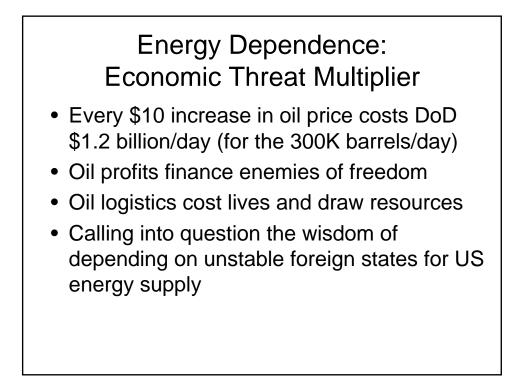
- Disappearance of Arctic Sea Ice
- Rapid Loss of Greenland Ice Sheet
- Collapse of the West Antarctic Ice Sheet
- Overturn of Atlantic Thermohaline Circulation
- Melting Kilimanjaro, Himalayan and other Glaciers Supporting Vast Human Populations
- Methane Release as Tundra Melts

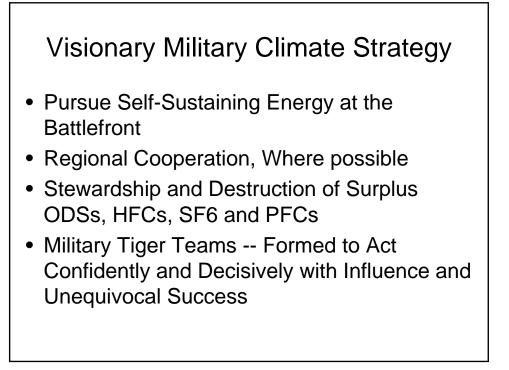
# First Impacts of Climate Change

- Higher Surface and Ocean Temperatures
- Rising Sea-Levels
- Changing Precipitation
- Fresh Water in Peril
- Health and Property Impacts
- Threatened Food, Fiber & Forests
- The Only Uncertainty is When and Where

#### Headline News

- National Research Council: :National Security Implications of Climate Change for U.S. Naval Forces
- US DoD 2010 Quadrennial Defense Review warns of climate change and urges action
- Brigadier General Steven M. Anderson (retired) NY Times Editorial: "Save Energy, Save Our Troops"
- UNFCC Executive Cristiana Figueres calls for military leadership on technology to protect climate
- Military technology: hybrid trucks & ships, battlefront energy, aviation biofuels, light-weighted cargo, integrated facility heating, cooling, wind & solar







### HFCs Obsolete & Unwanted

- New vehicle air conditioning
  - 30+% of global HFC use and emissions
  - GWP<150 for cars sold in the EU from 2011
  - EPA will un-SNAP HFC-134a (GWP=1440)
  - GM's choice is of HFO-1234yf (GWP=4)
  - Dozens more automakers endorse HFO-1234yf
- HFC phasedown under the Montreal Protocol supported by US, Canada, Mexico, FSM and 90+ nations
- With incentives, transition in vehicle AC can be completed within 4 years



## Elements of a Military Climate Strategy

- Reduce energy intensity of military operations at installations and by operational forces
- Incorporate climate change effects into force planning and infrastructure investments
- Stewardship and Destruction of non-energy GHG, such as surplus ODSs, HFCs, SF6 and PFCs
- Opportunities for military-to-military cooperation in nontraditional areas
  - Climate scenarios such as humanitarian relief
  - Measuring, monitoring and managing greenhouse gases from installations and land management and possibly operations
  - New energy technologies for installations
- Military Tiger Teams to conduct energy and GHG audits and recommend technology and management solutions



### Full Tool Box

- Energy Use Inventory and Performance Standards
- Life-Cycle Climate Performance (LCCP) and Comprehensive Environmental Assessment
- Carbon "Bootprint" Accounting and Measures of Emissions Reductions
- Global Case Studies
- Networks and Working Groups (including UNEP)
- Partnerships
  - Green Weapons Advocates
  - Ministries of Environment and NGOs
  - Foreign Offices & International Development Departments
  - Military research and development cooperation
  - Innovative public-private partnerships (e.g., ICOLP)

