Mt Eliza welcomes delegates and presenters to the 2008 UNICON conference
Mt Eliza
EXECUTIVE EDUCATION

SUSTAINABILITY
or
SURVIVAL
in a Changing World

William Kininmonth
CLIMATE CHANGE IS NATURAL

• **SUSTAINABILITY** implies managing a controlled steady-state system
• **SURVIVAL** requires ongoing adaptation to an ever-changing system

The fear of climate change fails to recognize that climate is forever changing.
Climate History from Ice Cores

Vostok, Antarctica
Earth is slowly cooling

Temperature values from the GRIP ice-core borehole in Greenland.

- The top left graph shows the past 100,000 years.
- The top right graph shows the past 10,000 years (the interglacial Holocene).
- The bottom graph shows the past 2,000 years.
Drying since the Holocene Optimum

Hanakaya, Saudi Arabia

Rock carvings of grazing animals – 4,000 years old

Evidence for a drying climate from North Africa, through the Middle East, and to Mongolia
As climate cooled from the Medieval Warm Period to the Little Ice Age glaciers advanced worldwide. Warming again set in during the early 18th century and the glaciers have retreated.

Today there is no sign of the glacier that had extended to the French village of Chamonix.
Rainfall over Southeastern Australia was greater in the second half of the 20th century than the first half.
CO$_2$ Forcing Needs VIAGRA!

CO$_2$ is a potent greenhouse gas but its Radiation Forcing potential is now nearly expended.
Evaporation constrains Surface Temperature

• More than 70 percent of Earth’s surface is ocean or well-watered land

• As surface temperature rises by 1°C:
  – IR emission increases 5.4 W/m²
  – Latent heat loss increases 6.0 W/m²

• The radiation forcing from a doubling of CO₂ concentration (3.7 W/m²) can only sustain a surface temperature rise of 0.3°C
• The climate system is complex and subject to many interacting processes.
• It is only in the last 5 years that routine measurements of the subsurface ocean circulations have been available.
• Models cannot represent deep convection.
• Models grossly underestimate evaporation increase with temperature.
Summarising the Science

• Climate is:
  – Naturally variable
  – Regulated by a variety of influences
  – Not predictable

• Variations of climate have profound impact
Misunderstood Science
Misguided Policies

• Geosequestration (burying) CO₂
  – Burn fossil fuels (non-renewable) faster!

• Redirect agricultural focus
  – Bio-fuels replace food crops to the detriment of the world’s poor?

• Environment policies focus on reducing CO₂ emission rather than clean air, clean water, ecosystem preservation, etc
SUMMARY

• Humankind faces real problems but human-caused global warming is not one!
  – Climate will change faster than we are prepared for
  – Water, renewable energy and food production are each regulated by changing climate

• SURVIVAL requires different policies to those for SUSTAINABILITY