A Sustainable Focus:
HAVING THE ADULT CONVERSATION & SETTING THE STAGE FOR TOMORROW

Apr 2016

Len Hering, RADM, USN (ret), Executive Director

Accelerating the transition to a sustainable world powered by clean energy
CSE Mission: Accelerate the transition to a sustainable world, powered by clean energy
3 Reasons for a Sustainable Future

What are yours?
How sustainable are we?

Reflecting on energy and AB 32
Simple supply and demand.
OUR OCEAN’S HEALTH
Where life itself evolved
State of the Oceans

85% of fisheries fully exploited, over-exploited or depleted
35% of mangroves lost or destroyed
20% of coral reefs destroyed
250,000 square miles of dead zones

If better managed, the production value of fisheries could increase from $120 billion to $900 billion

OUR OCEAN
Where life itself begins.
There is an estimated 200 million tons of plastic littering our oceans.

- The majority of this plastic debris ultimately finds its way to one of these massive swirling gyres.

- The largest of the oceanic gyres is the Great Pacific Garbage Patch.

- In parts of the Great Pacific Garbage Patch, there are over 2 million pieces of plastic per square mile of ocean.

- While plastic is not biodegradable, it is photodegradable. Sunlight breaks it down into ever-smaller pieces known as microplastics.

- Over 90% of plastic pollution is made up of microplastics smaller than your fingernail.

- These microplastics often absorb highly toxic chemicals like DDT & PCB.

- Unable to distinguish microplastics from food, many animals starve to death, their bellies choked with plastic; others survive just long enough to contaminate our food chain.

- Hindered by a stale way of thinking, gyre cleanup has been virtually nonexistent. Thanks to recent innovations in science and technology, hope is on the horizon.

- Our oceans could well be void of life within the next two generations if nothing is done to stem this.

**Decomposition Rates**

- Banana peel: 2-3 wks
- Paper: 5-10 wks
- Cigarette butt: 10-15 yrs
- Aluminum cans: 200-500 yrs
- Glass bottles: 100,000 yrs
- Styrofoam: never*
- Plastic bottle: never*
- Fishing line: never*
- Plastic bag: never*

* Plastic is not biodegradable.
Humanity and Nature
Rain forests vanishing at rapid rate

From Brazil to central Africa to Asia's archipelagos, human encroachment is shrinking the world’s forests, spewing heat-trapping carbon dioxide into the atmosphere. Africa is losing trees fastest. The world’s nations have begun talks on a plan to pay poorer nations to preserve their forests.

Change in forest area, 2000-2005

Net loss
- More than 4 million acres
- 3.9 million to 500,000
- Up to 500,000 acres
- No significant change

Net gain
- Up to 700,000 acres
- More than 700,000

SOURCES: Food and Agriculture Organization of the United Nations; ESRI

AP
Man and Nature.

The extinction rate today is more than 100X the level it was before humans walked the earth. 19,817 species are listed as endangered.

Species numbers and population sizes have dropped by almost 30% in the past 100 years.

Two species have gone extinct every day since 2010.

Thylacine
Extinct 1936

Golden Toad
Extinct 1989
The basic element of life: fresh water
Things are Bad and Getting Worse

U.S. Drought Monitor
California

IntENSITY:
D0 - Abnormally Dry
D1 - Moderate Drought
D2 - Severe Drought
D3 - Extreme Drought
D4 - Exceptional Drought

<table>
<thead>
<tr>
<th>Week</th>
<th>Noting</th>
<th>D0</th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
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</thead>
<tbody>
<tr>
<td>1/14/2014</td>
<td>1.43</td>
<td>86.57</td>
<td>94.18</td>
<td>62.71</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>1/7/2014</td>
<td>1.43</td>
<td>86.57</td>
<td>94.25</td>
<td>87.53</td>
<td>27.59</td>
<td>0.00</td>
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</table>
Things are Bad and Getting Worse
Things are Bad and Getting Worse

Alarm bells toll for human civilization as world's 12th largest mega-city to run out of water in just 60 days

Wednesday, December 03, 2014
by Mike Adams, the Health Ranger
Tags: mega-cities, water supply, human civilization
Population Explosion & Its Effects
World Population Growth

This is the equivalent of adding a China and India to the face of the globe in the next 40 years.
Failure to act on climate change means an even bigger refugee crisis

Global warming does not cause the conflicts that have caused mass movement of people, but it would be wrong to say it does not contribute
Food Supply

*Excess taken to a new level*
To feed the expected population of 2050, man will need to produce more food in the next 40 years than we have in the past 10,000 years.
While the rest of the world starves

Americans are throwing away 40% of food in the U.S. each year
Sea Level Rise & Its Effects
Sea Levels Have Risen At A Fairly Constant Rate Since the Little Ice Age

People at Risk from a 44 cm sea-level rise by the 2080s
Assuming 1990s Level of Flood Protection

More Than 400 U.S. Cities May Be 'Past The Point Of No Return' With Sea Level Threats

But there are still cities that could be saved by reducing carbon emissions.

Lydia O'Connor
Associate News Editor, The Huffington Post

Posted: 10/13/2015 07:28 PM EDT | Edited: 10/14/2015 06:19 AM EDT

A woman walks atop an earthen levee on the Mississippi River in the Lower 9th Ward as the Steamboat Natchez passes in August 2015 in New Orleans. The city is ringed by hundred of miles of levees to protect against flooding.

MARIO TAMA/GETTY IMAGES

Millions of Americans live in places where it's too late to slow the threat of rising sea levels, a new study warns, and researchers are hoping those findings will serve as a call to action for cities that can still be saved by cutting carbon emissions.
Climate change is the biggest long-term security threat in the Pacific region.”

Admiral Sam Locklear, Commander U.S. Pacific Command
Developing countries account for 70 to 85 percent of productivity opportunities
% of total productivity opportunity by resource and region

1 Rest of developing Asia includes Central Asia (e.g., Uzbekistan), South Asia (e.g., Bangladesh), Southeast Asia (e.g., Laos), and North Korea.
2 Includes water savings from water-specific levers as well as water savings from improved agricultural productivity.
3 For steel, the chart represents all the demand-side levers and the scrap recycling lever but excludes supply- and conversion-side levers.

NOTE: Numbers may not sum due to rounding.
SOURCE: McKinsey analysis

McKinsey Global Institute

The 20th Century: Bloodiest in History
Can we avoid a similar fate for the 21st century?
Where the rubber meets the road
SOLAR\textsuperscript{10}
23,000 TWy/year

2009 World energy consumption
16 TWy/year

2050: 28 TWy

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Where there’s wind there’s energy
Where there’s wind there’s energy

Combine it with storage and there’s independence and security
Geothermal, harnessing the earth's own energy source
U.S. is a solar rich environment
Utility Scale Solar
Schools, Businesses and Colleges
Residential solar and small scale distributed generation
It can even be artistic
Lighting the way can be a revolution.
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<table>
<thead>
<tr>
<th>Light Bulb type</th>
<th>Initial Cost</th>
<th>Efficiency</th>
<th>Operating Cost</th>
<th>Carbon Footprint</th>
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</thead>
<tbody>
<tr>
<td><strong>Incandescent</strong></td>
<td><strong>Cost</strong></td>
<td><strong>Watts</strong></td>
<td><strong>KWh \times $0.23</strong>&lt;br&gt;(cost to operate)</td>
<td># of bulbs used per 60K hours</td>
</tr>
<tr>
<td>Average lifespan: 1500 hours</td>
<td>$1.38</td>
<td>60 watts</td>
<td>$821.72 per 60,000 hours</td>
<td>40 bulbs</td>
</tr>
<tr>
<td><strong>CFL</strong></td>
<td><strong>Cost</strong></td>
<td><strong>Watts</strong></td>
<td><strong>KWh \times $0.23</strong>&lt;br&gt;(cost to operate)</td>
<td># of bulbs used per 60K hours</td>
</tr>
<tr>
<td>Average lifespan: 10,000 hours</td>
<td>$2.98</td>
<td>14 watts</td>
<td>$191.73 per 60,000 hours</td>
<td>6 bulbs</td>
</tr>
<tr>
<td><strong>LED</strong></td>
<td><strong>Cost</strong></td>
<td><strong>Watts</strong></td>
<td><strong>KWh \times $0.23</strong>&lt;br&gt;(cost to operate)</td>
<td># of bulbs used per 60K hours</td>
</tr>
<tr>
<td>Average lifespan: 50,000 - 60,000 hours</td>
<td>$10.23</td>
<td>6 watts</td>
<td>$82.17 per 60,000 hours</td>
<td>1 bulb</td>
</tr>
</tbody>
</table>

**Total Cost =**
- **Incandescent:** $875.52
- **CFL:** $209.61 (76% Cost Savings)
- **LED:** $92.40 (90.6% Cost savings)
Convert for a smarter future
Convert for a smarter future
Take recycling serious
Think differently about the future; alter behaviors
Smartscape where it make sense
Change in the making
Change in the making
Solutions abound

Mixing it up.
Some are ahead of the curve

It is possible!
Every reduction and change counts
3 Reasons for a Sustainable Future

What are yours?
energycenter.org.