

Energy and Environment: Progress and Existence

Energy Provides **Existence** and Is Cause for **Change** (hopefully Progress)

Energy is possessed (thus equilibrium property) by material systems and redistributed (transferred) between and within system(s), due to systems' non-equilibrium, via forced-displacement interactions (process) towards the equilibrium (equi-partition of energy over mass and space); thus energy is conserved (the 1st Law) but degraded (the 2nd Law).



DOE-EERE Energy

MEE 101 Energy and Environment

This is a course essential for every person and the whole society, and it is an introductory course for everybody.

'Energy and Environment for Everybody'

Details at: www.kostic.niu.edu/energy

More at: www.kostic.niu.edu

Sustainable Energy * Climate (IPCC w) *

Car Fuel Economy & Performance

SEnergy



Utilities-Appliances*CEE

Prius*G-Prius
HSD* Prius
Power Train



Myths, Facts,
and Hype

YES, Thermodynamics, a science of energy, and the Mother of All Sciences will provide vision for the future energy solutions.

M. Kostic: *Work, Power, and Energy* article in the [Academic Press/Elsevier's Encyclopedia of Energy](#) (C.J. Cleveland, Editor-in-Chief), Volume 6, pp. 527-538, ISBN: 0-12-176480-X, Elsevier, 2004.

M. Kostic, *Energy: Global and Historical Background*, and *Physics of Energy*. In [Encyclopedia of Energy Engineering and Technology](#) (B. L. Capehart, Editor), ISBN: 978-0849336539, Taylor & Francis/CRC Press, 2007. [[Amazon](#)]

NOTE: If PDF file appears blank, use <BACK then FORWARD> browser key to display it, or copy PDF file and then display it!

Energy and Environment (www.kostic.niu.edu/energy):

Happiness Is Measure of Success of Progress and Existence in Harmony

Global Energy and Future:
Importance of Energy Conservation and Renewable and Alternative Energy Resources

NIU
March, 2006

NORTHERN ILLINOIS UNIVERSITY
1895-1995

Prof. M. Kostic
Mechanical Engineering
NORTHERN ILLINOIS UNIVERSITY

www.kostic.niu.edu

Humanity's Top Ten Problems for next 50 years

1. ENERGY (critical for the rest nine)

- Water
- Food
- Environment
- Poverty
- Terrorism & War
- Disease
- Education
- Democracy
- Population

2006: 6.5 Billion People
2050: 8-10 Billion (10¹⁰) People

www.kostic.niu.edu

What Are We Waiting For?

- (1) An Energy Crisis ?
- (2) A Global Environmental Problem?
- (3) An Asian Technology Boom?

• or **Leadership**

www.kostic.niu.edu

The biggest single challenge for the next few decades by 2050

- (1) ENERGY for 10¹⁰ people
- (2) At **MINIMUM** we need additional 10 TeraWatts (150 Mill. BOE/day) from some new clean energy source
- We simply can not do this with current technology!**
- We need Leadership**

www.kostic.niu.edu