

# A Short Look at the Long View

*Some Areas of Interest for Innovation between 2010 and 2030*

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*Note: These trends were discussed by Joel Barker at our Nov. 17, 2011 Professional Development Meeting and are provided to you, courtesy of Joel Barker. You will need to Google these topics for more information.*

- **Demographics**

Often ignored until too late

**Age Wave** by Ken Dychtwald

Foreign Affairs, January 2010: *“The New Population Bomb”* by Jack A. Goldstone identifies four megatrends

Foreign Affairs, December 2010: *“The Demographic Future”* by Nicholas Eberstad

- The Old and the Young
- All developed countries are now on pathway to aged population
  - Europe
  - North America
  - Japan
  - Korea
  - China starting in 2030

- **Trend #1**

“The world’s developed countries will drop to less than 25% of the world’s population by 2050

- **Trend #2**

The developed countries labor forces will substantially age and decline raising the demand for immigrant workers

- **Trend #3**

Most of the world’s population growth is expected to come from today’s poorest, youngest, least educated and most heavily Muslim countries.

- **Trend #4**

Most of the world's population will be located in urban areas rather than rural areas.

- **Trend #5**

Half the world's population now lives in countries where fertility rates are below replacement level

Includes low-income societies in every Asian country and much of southeast Asia and many Islamic countries

- **Trend #6**

There will be a huge fall-off in "young manpower" across the globe

Only sub-Saharan Africa will see significant growth.

- **Trend #7**

Largest growing segment of working-age population will be in the 50-65 age group

Especially huge in China which will face special problems with retirement and health care of the elderly

- **Trend #8**

Russia is especially threatened because not only are they not producing children close to a replacement rate, their life expectancy is shrinking.

- **Trend #9**

India's growth pattern is such that they will maintain a youthful population, especially when compared to their neighbors

Japan faces the worst overall situation and will probably see a 17% decrease in population

- **Trend #10**

Of all the developed countries, only the USA will grow in population: from 310 million to 374 million by 2030

This is driven by our willingness to accept immigrants and significant fertility of our young population

- **New Alliances**

Europe and North Africa

North America and South America

Asia and South Pacific island nations

## Japan and robots

- Energy

  - Shale Gas

  - 70+ years USA supply at reasonable cost

  - Great coal replacement

  - Europe and  
China have it

  - Dyesol Solar Panels

    - Nonsilicon

    - Works in nondirect sunlight

  - Algae Solar Cell Diatoms

  - Wind Stalks

  - MIT Liquid Metal Battery

  - Paper Batteries

    - Stanford invention

    - Ordinary paper + nanotubes + ink + silver nanowire = paper battery

    - Supercapacitor

    - Large scale/cheap/light

  - Traveling Wave Nuclear Reactor

  - Power Towers

  - E-Coli Bio-diesel

  - Exothermic plants

  - Luna Ring

  - Antiprotons in Orbit

- Materials

  - Rubber Sidewalks from Old Tires

  - Metal foams

- **Bamboo**
  - Textiles**
  - Laminated building materials–GluBam**
- **Calera “Coral” Cement**
  - combines calcium from sea water with CO2 coming out of a power plant to make cement**
  - Demonstration plant is making 1000 tons of cement a day and sequestering 550 tons of carbon: Popular Science 12/10 p.31**
- **Silk worms produce “spider” silk**
- **Nano Paper: tough as iron**
- **Bucky Paper: Stronger Than Steel, Harder Than Diamonds**
- **Graphene**
- **Graphene Computer Chips**
- **Graphene Super-sized**
  - Difficult to make large sheets**
  - Japanese, Korean and Singapore project has produced 30 inch sheets**
  - Has the potential of replacing rare earth technology for LCD’s and touch screens**
- **Toxic-Water Sponge: Osorb**
- **Transportation**
  - **100 mpg Car**
  - **EcoMotors 100 mpg IC engine**
  - **MDI Air Powered Car**
  - **Michelin Active Wheel**
  - **VW’s Active Wheel Car**
  - **Electric Airplanes**

- Car Plane
- Private Submarines
- Damien Cally's 2-Wheeler
- Hybrid Airships
- Skylifter Dirigible
- The New Agriculture
- Bio-Char/Terra Preta:  
carbon capturing
- Fungi communication
- WaterDisxx
- Vertical Farms, Sc. Am, Nov. 2009
- Detroit: Urban Agriculture?
- Rooftop Gardening
- Global Buckets
- Legalized Marijuana  
\$2 per gram tax estimated to bring in \$1.4 billion in California alone
- The New Urban  
Energy Advantage  
"The average New Yorker produces just 30% of the greenhouse emissions of the average US citizen." New Scientist  
Chinese are building cities to try to avoid suburban-ization.
- Skyscraper Efficiencies
- Health Care
- UV versus MRSA
- Readymade Blood Vessel–Humacyte
- Retail Stem Cells
- Parasites as Medicine

- **Old Brains/Young Brains**

Prof. Gallant U of Cal Berkley

Yale University: Mark Laubach: Blocked specific chemical reaction occurring in old monkey brain restoring capacity equal to young monkey

- **The Digital Reality**

*"This new digital reality is replacing our thousands-of-years-old physical reality as the primary source of information that shapes our minds, our actions, our lives."*

Jan Amkreutz, APF

- **Communications**

- **Apple's Siri**

- **eBook and iPad**

- **Digital Contact Lenses**

- **Viewing the Mind**

- **Micro Medical Lab**

- **3D Printers**

- **Thing-O-Matic**

- **Printing a UAV**

- **Robots**

- **Programmable Clothing**

- **Cotton Transistors**

- **Biological Computing**

- **Wired bees**

- **Back to Earth**

- **What are the implications of all of these things?**

- **21<sup>st</sup> century requirement: to understand the long term implications of what we are getting into before we invest**