

**NADO Annual Training Conference**  
**15 October 2018**

# **‘The Future of Regions’ Implications for NADO**

**David Beurle**  
**CEO**



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# **The challenge for today...**

***Explore the future***

***Ask the hard questions***

***Think creatively***

**The outcome will be a new view of the future and consideration of the implications for regions and NADO.**



January 2015

## CITIES OF THE FUTURE

ANTICIPATING TRENDS AND POSSIBILITIES



## THE FUTURE OF MANUFACTURING

BUILDING THE FUTURE THROUGH AGILITY AND INNOVATION



## SCENARIOS OF THE FUTURE

ALLEN COUNTY OHIO DEFENSE

Report for Allen County Ohio Defense, prepared by Future IQ, November 2014



## INDUSTRY CLUSTER AND ECONOMIC IMPACT ANALYSIS

Edina Minnesota, USA



## ECONOMIC DEVELOPMENT AND ENGAGEMENT

Edina Minnesota, USA



## THE NEXT INDUSTRIAL REVOLUTION

A NEW ERA - ROBOTICS, AUTOMATION AND LIFE SCIENCES

Prepared by Future IQ  
November 2017



## THE FUTURE OF FOOD

FEEDING THE WORLD - THE COMING FOOD REVOLUTION



## GLOBAL FOOD SCENARIOS

SCENARIOS





**Forces impacting the  
world and regions**

**What are the  
emerging macro  
drivers...**

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# **Macro Trends and Forces of Change Related to . . .**

- **Demographics, population and mass urbanization**
- **Changing macro economics and societal values**
- **Energy, food, water & changing climate**
- **Technology, and the next industrial revolution**



# Demographics, Population, Mass Urbanization

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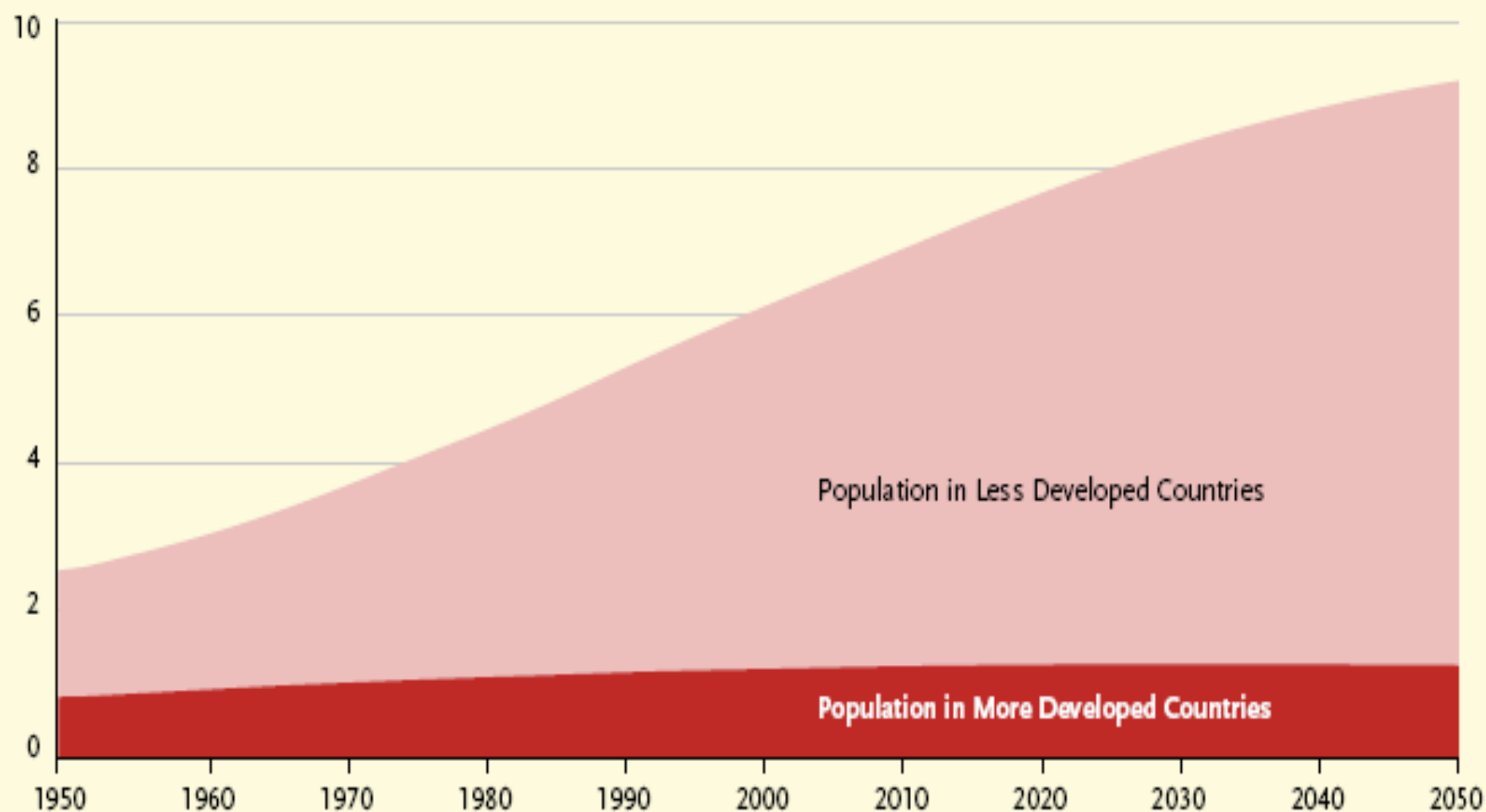
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## Global Population Growth Is Driven By Developing Countries.

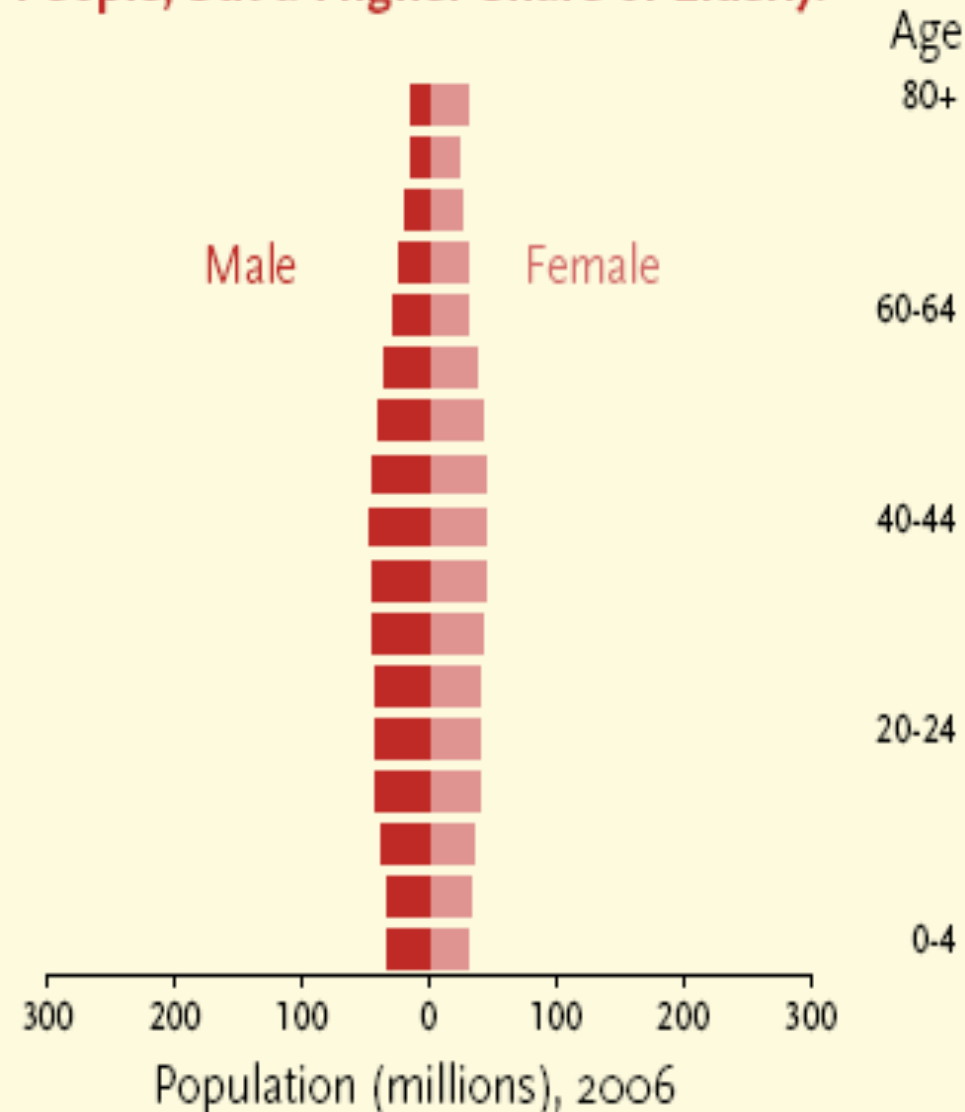
World population in billions, 1950-2050 (projected)



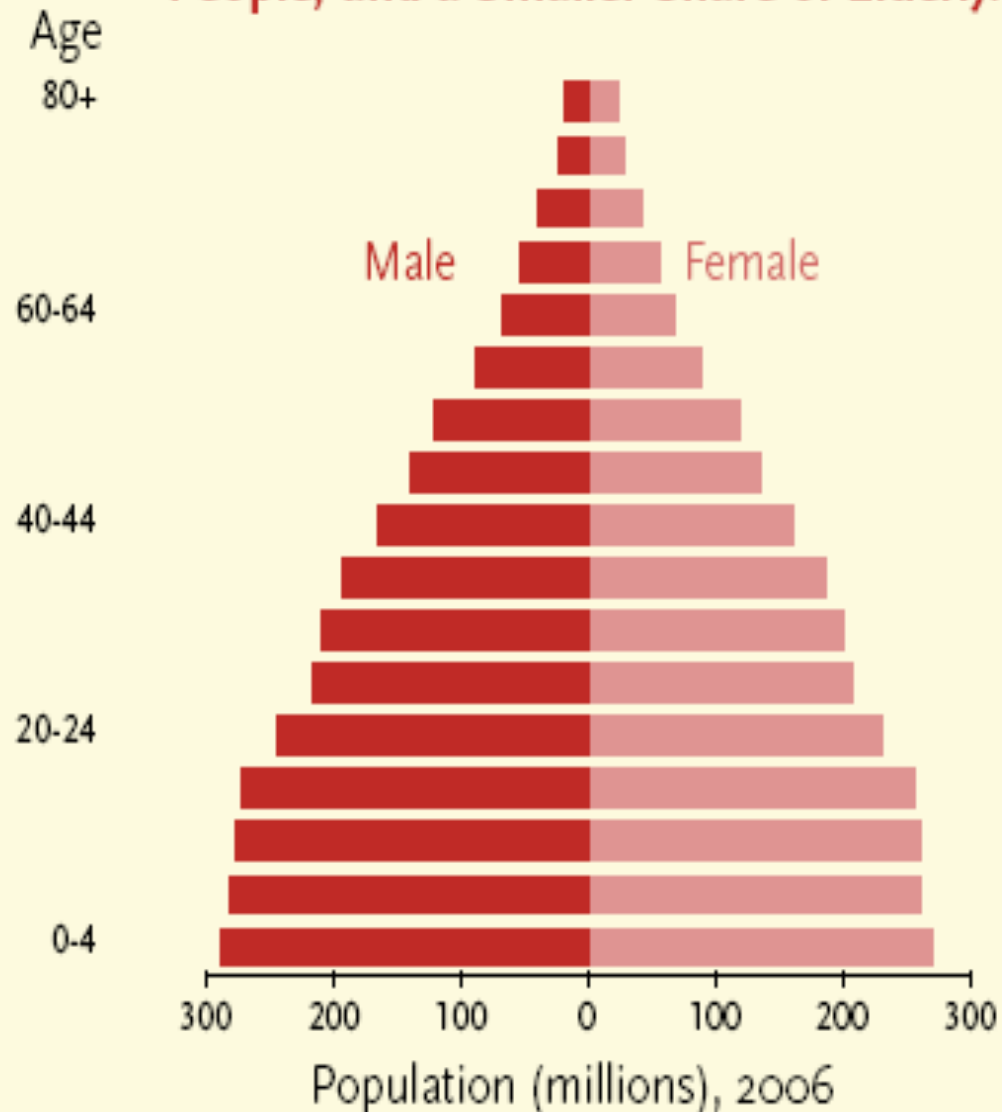
SOURCE: United Nations, *World Population Prospects: The 2006 Revision* (2007).



## Developed Countries Have Fewer Young People, but a Higher Share of Elderly.

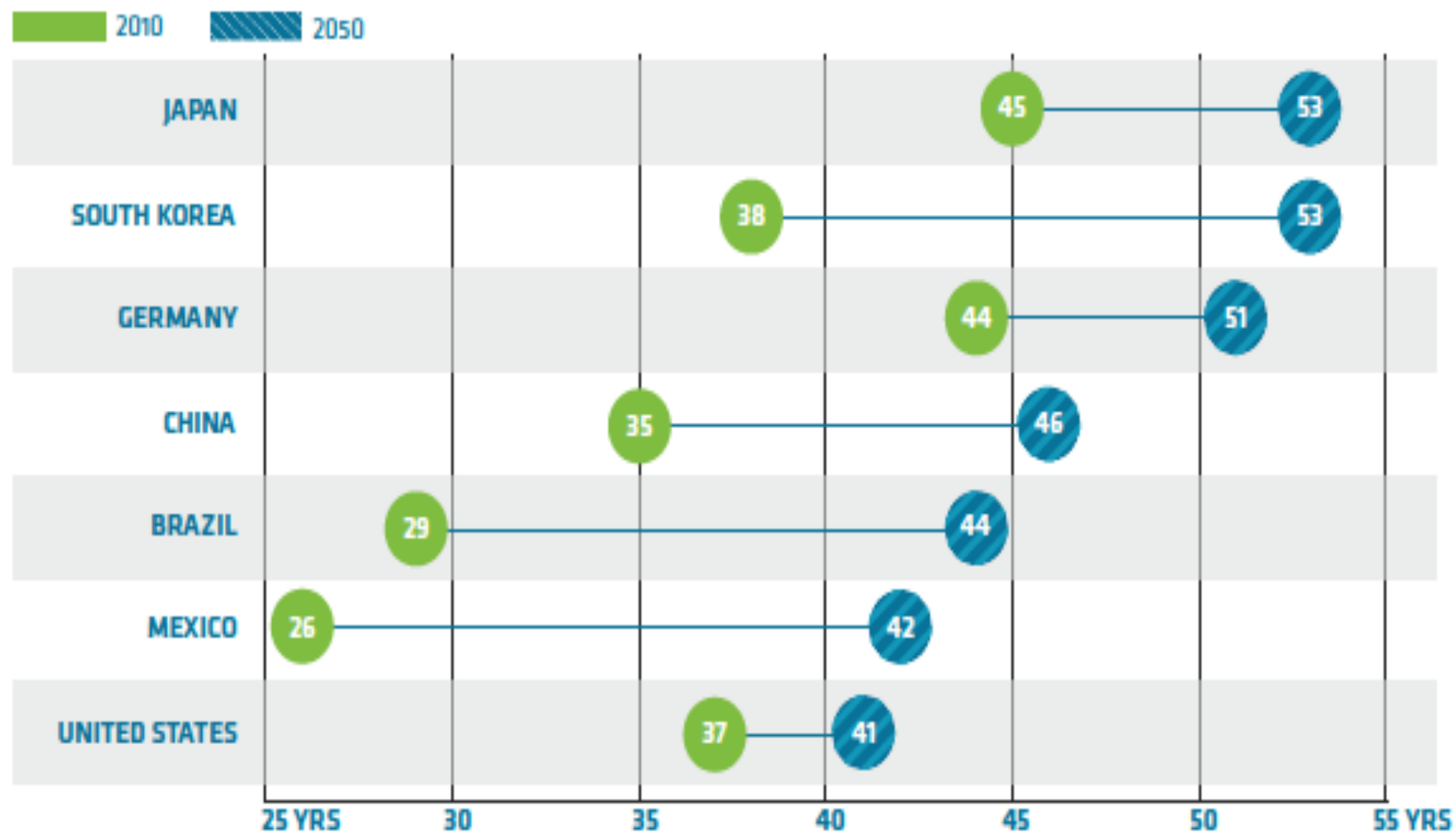


## Developing Countries Have More Young People, and a Smaller Share of Elderly.



SOURCE: United Nations, *World Population Prospects: The 2006 Revision* (2007).

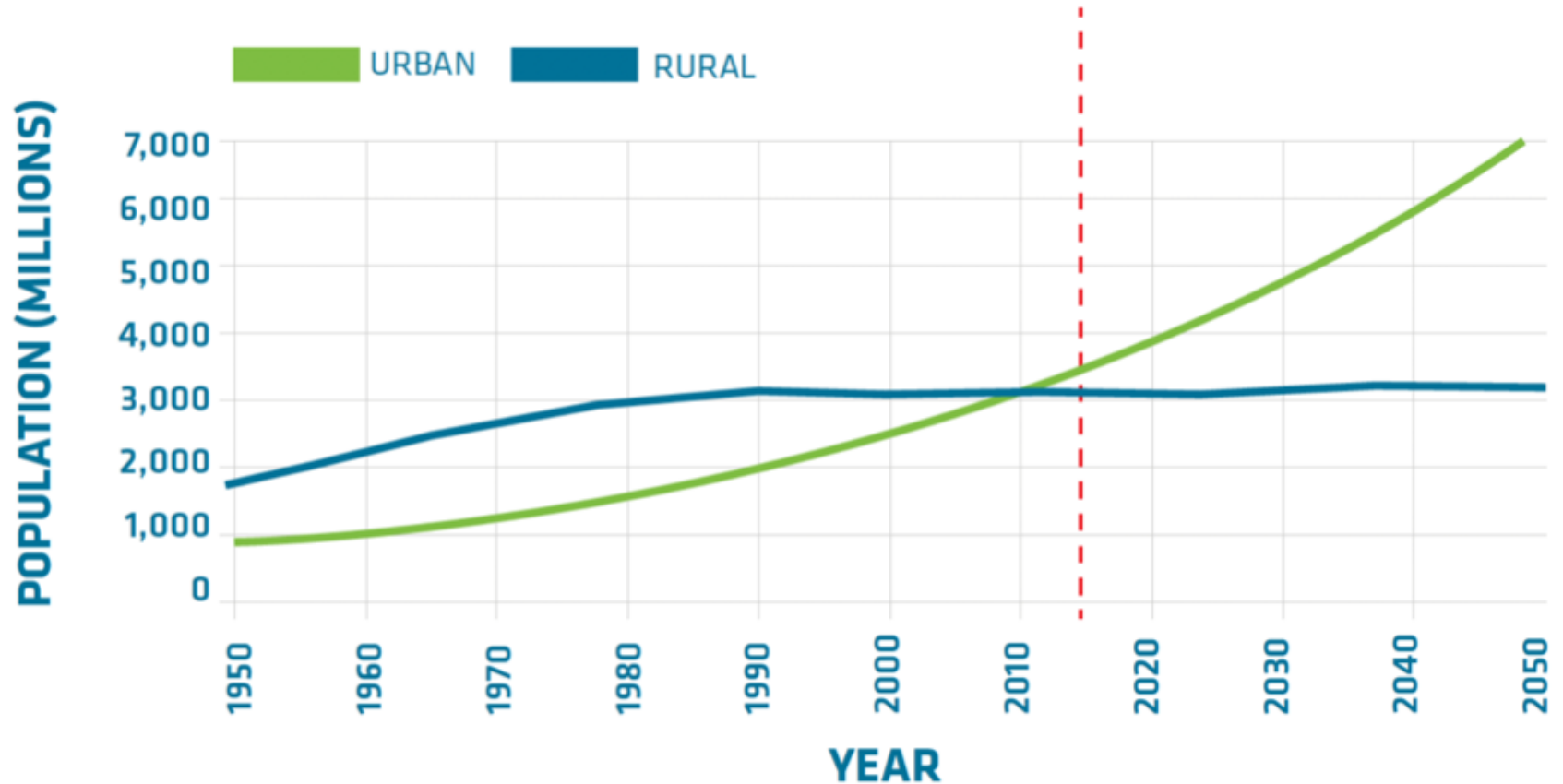
## ESTIMATED MEDIAN AGE IN SELECTED COUNTRIES,



*“The urban population in 2014 accounted for 54% of the total global population, up from 34% in 1960, and continues to grow.”*

*World Health Organization (2015)*

*URBAN AND RURAL POPULATION OF THE WORLD, 1950-2050*



Source: United Nations, Department of Economic and Social Affairs. World Urbanization Prospects, The 2014 Revision.



# AN URBAN WORLD

This graphic depicts countries and territories with 2050 urban populations exceeding 100,000. Circles are scaled in proportion to urban population size. Hover over a country to see how urban it is (percentage of people living in cities and towns) and the size of its urban population (in millions).

## Urban Population

- Greater than 75%
- 50% - 75%
- 25% - 50%
- Less than 25%



1950



# AN URBAN WORLD



This graphic depicts countries and territories with 2050 urban populations exceeding 100,000. Circles are scaled in proportion to urban population size. Hover over a country to see how urban it is (percentage of people living in cities and towns) and the size of its urban population (in millions).

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2010



# AN URBAN WORLD



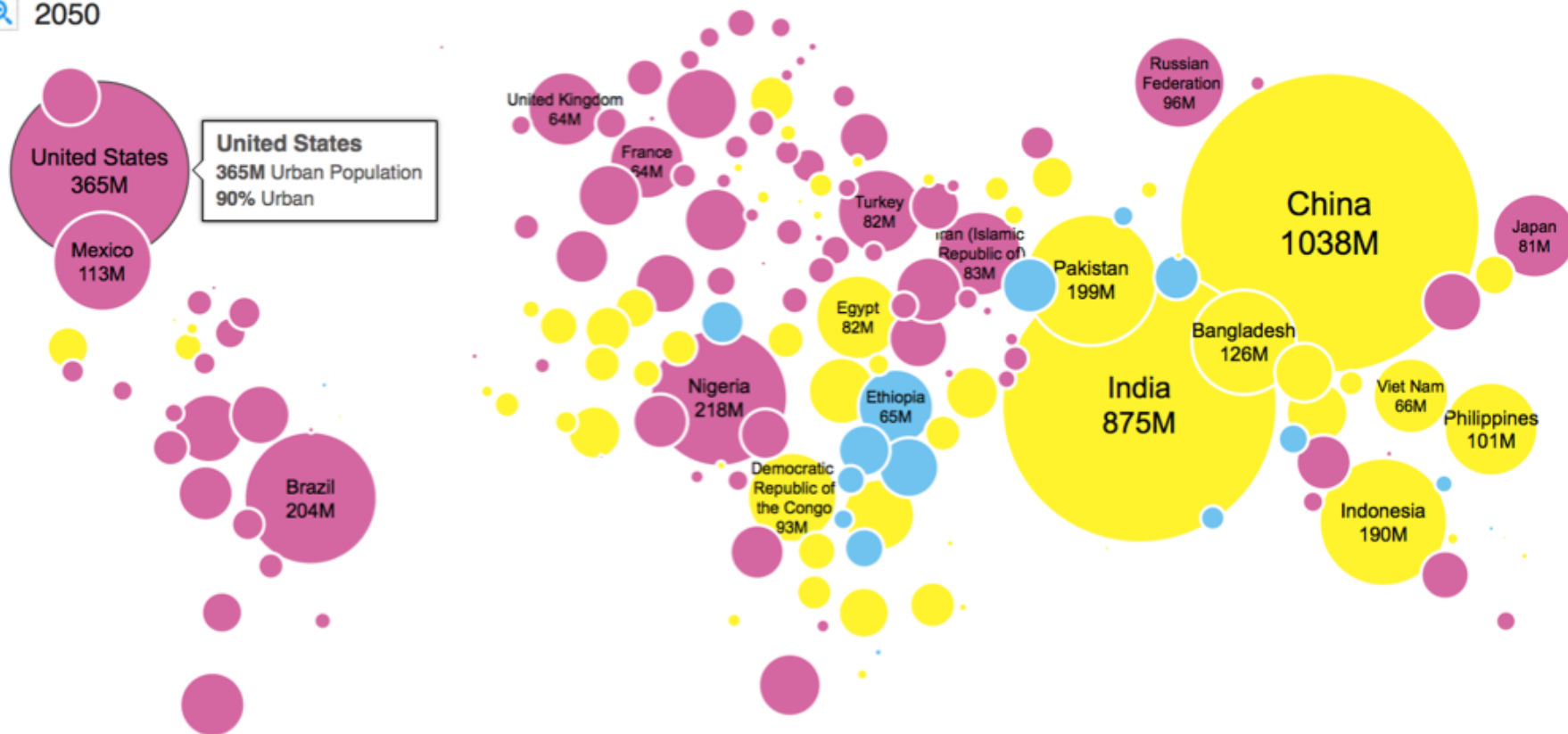
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- 50% - 75%
- 25% - 50%
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2050





# CITIES OF THE FUTURE

ANTICIPATING TRENDS AND POSSIBILITIES





**Within a 10 year period,  
India's working  
population increases by  
250 million – to over 870  
million people.**

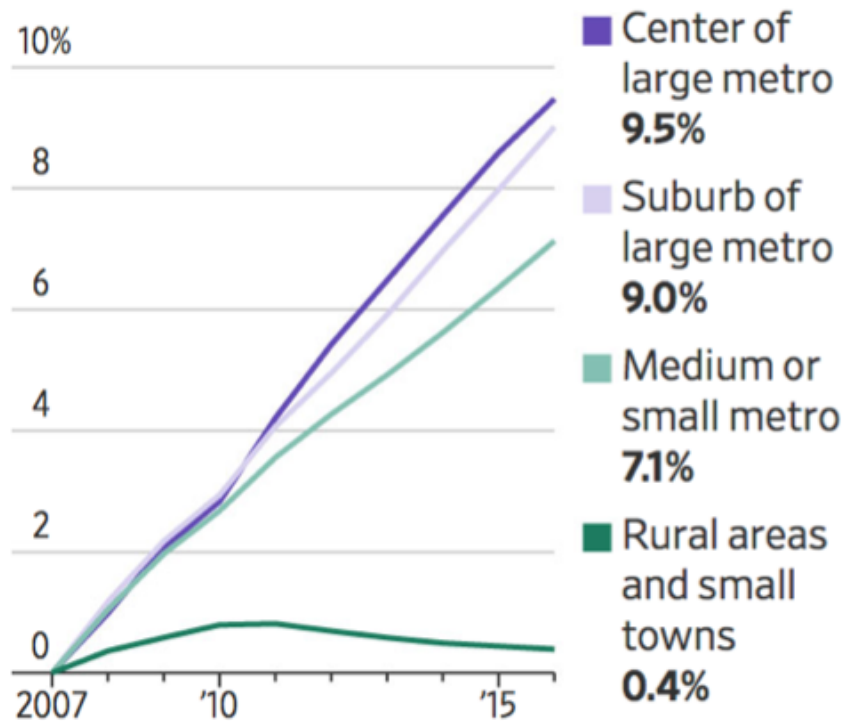


**Within a 20 year period,  
half of all the new  
buildings in the world are  
being built in China.**



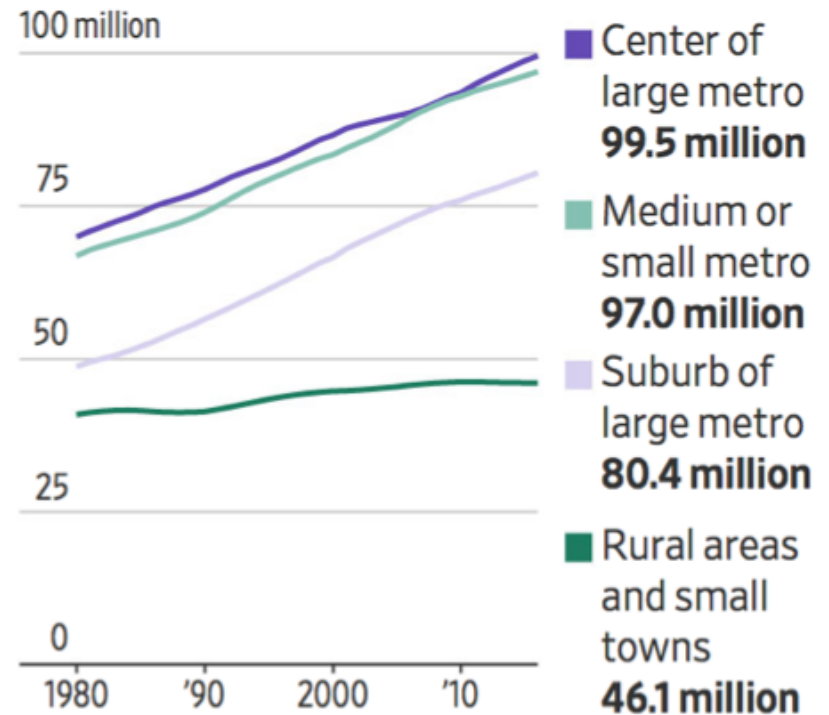
# Changing distribution of America society

## Change in population since 2007



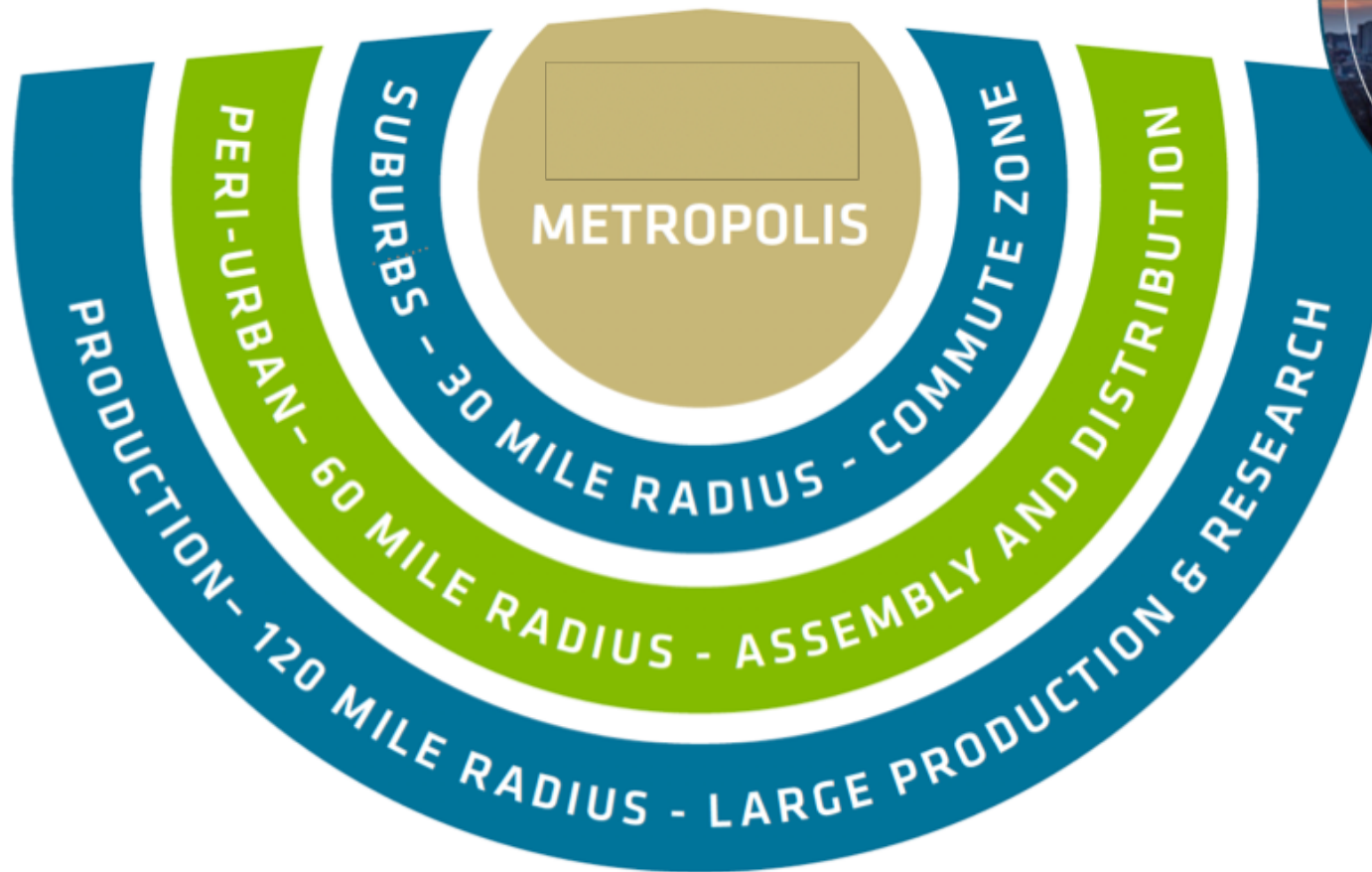
Source: Census Bureau

## Total U.S. population



Source: Census Bureau





# Demographics, Population, Mass Urbanization

- Increasing global population
- People are living longer
- Global surge in younger cohorts
- Greater urbanization and mega cities
- Society is reconfiguring around urban hubs

# **Global population growth and urbanization**

## **What does this mean for Regional Development?**



# Changing macro-economics and societal values

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The major nations of the developed world (North America, Japan, western Europe) have 15% of the total global population and 80% of the wealth.



This gap between the developed and developing world is closing fast.

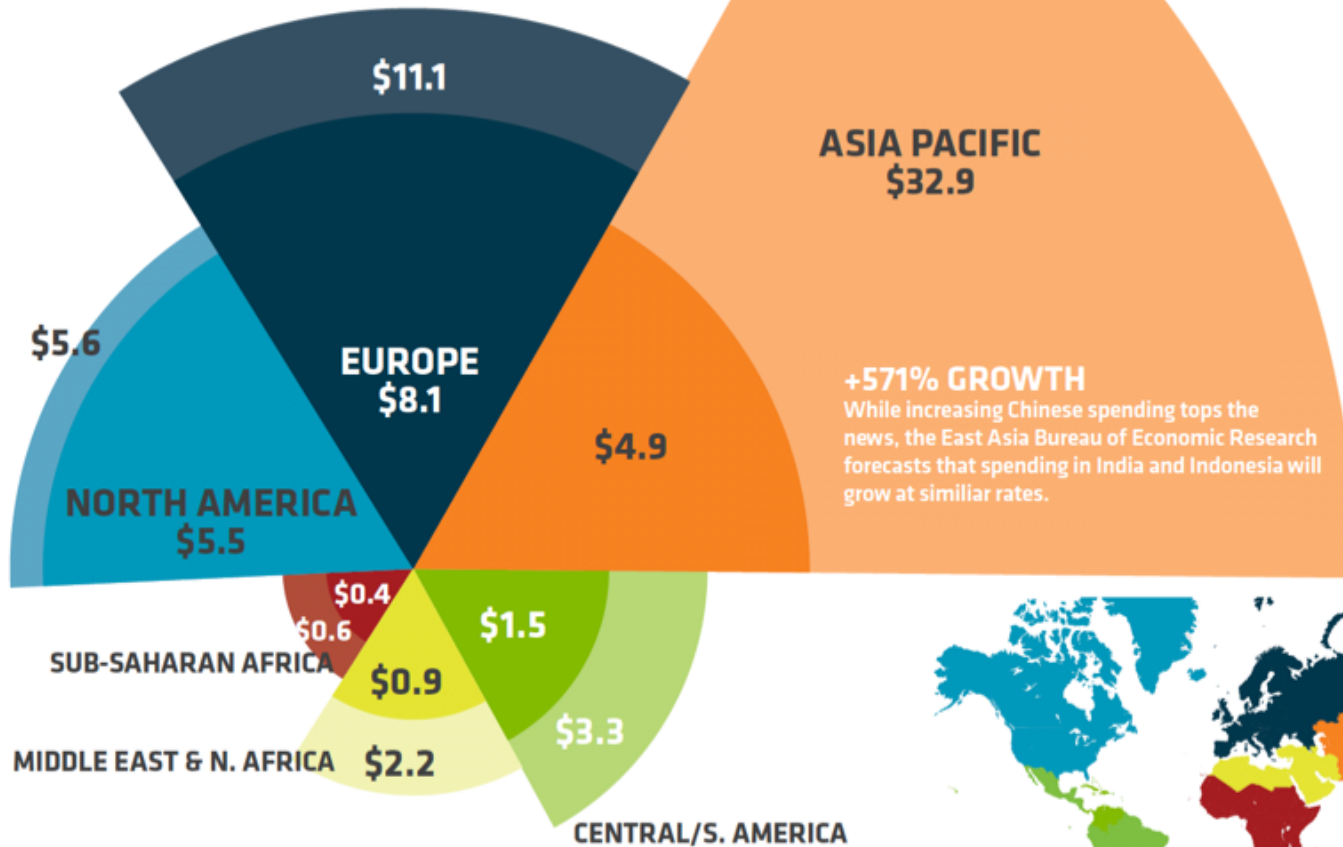




## MIDDLE CLASS CONSUMER SPENDING

OUTER RING: 2030 IN TRILLIONS, USD

INNER RING: 2009 IN TRILLIONS, USD



Source: Kou, L. 2013. The world's middle class will number 5 billion by 2030. Quartz.  
Figures based on OECD, 2012. An emerging middle class.



## Built Environment is a Direct Reflection of the Underlying Economy



### Agriculture Economy

- 1<sup>st</sup> version of the American Dream
- “40 Acres and a Mule”



### Industrial Economy

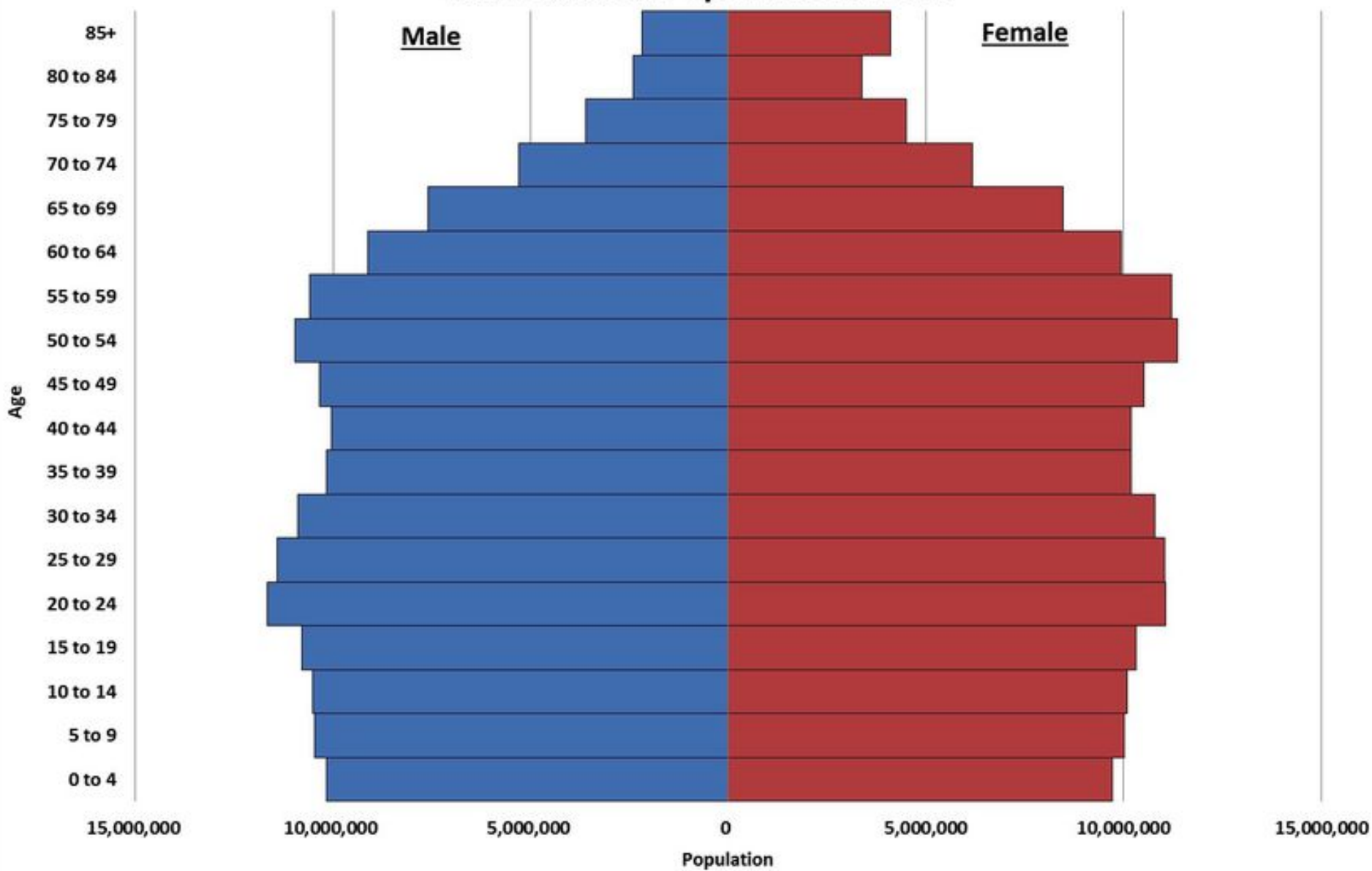
- 2<sup>nd</sup> version of the American Dream
- Drivable Sub-urban...”See the USA in Your Chevrolet”



### Knowledge/Experience Economy

- Current/Future version of the American Dream
- *Option* of Walkable Urban and Drivable Sub-urban

**Chart 1: Population Pyramid of the U.S.  
Total Resident Population in 2015**



Source: U.S. Census Bureau, Vintage 2015 Population Estimates.



connectivity

HIGHER



MORE walkable areas



- 41% - plan to rent for at least 3 years.
- 77% - plan to live in urban walkable area.



Gen Y will shift toward homeownership in 2012

2/3

say that living in a walk able community is important

1/3

will pay more to walk to shops, work, and entertainment

Gen Y seeks diversity, walk ability, and proximity to jobs

In-town areas and inner suburbs will remain on an upward trajectory





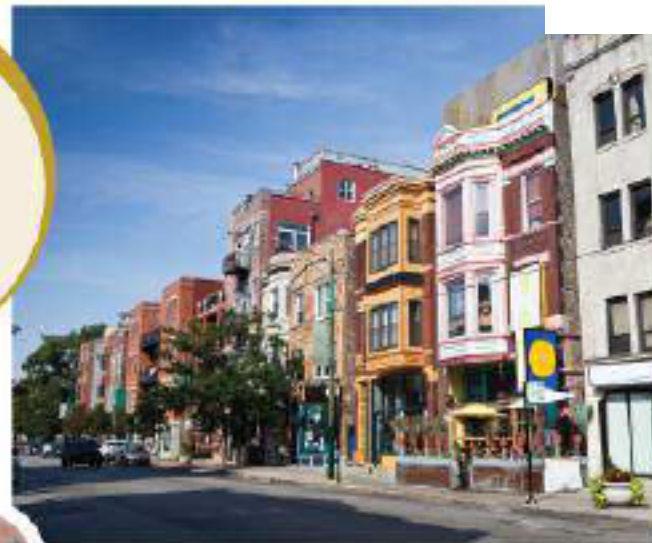
Boomers seeking communities that:

Have a village or town center with destinations and services close by

Have flexible office space in a town-center environment

Facilitate making new friends

Are low-maintenance



Baby Boomers seeking active lifestyles, more interaction  
Boomers have made "third places" like Starbucks, Barnes and Noble, and Borders their "community center"

National Association of Realtors, Smart Growth America, 2004.  
Robert Charles Lesser Company.

# Macro-economics, shifting power and changing societal values

- Uneven global growth and deflation
- US global role is changing
- Society in USA and world is changing.

**Changing macro-economics and  
societal values**

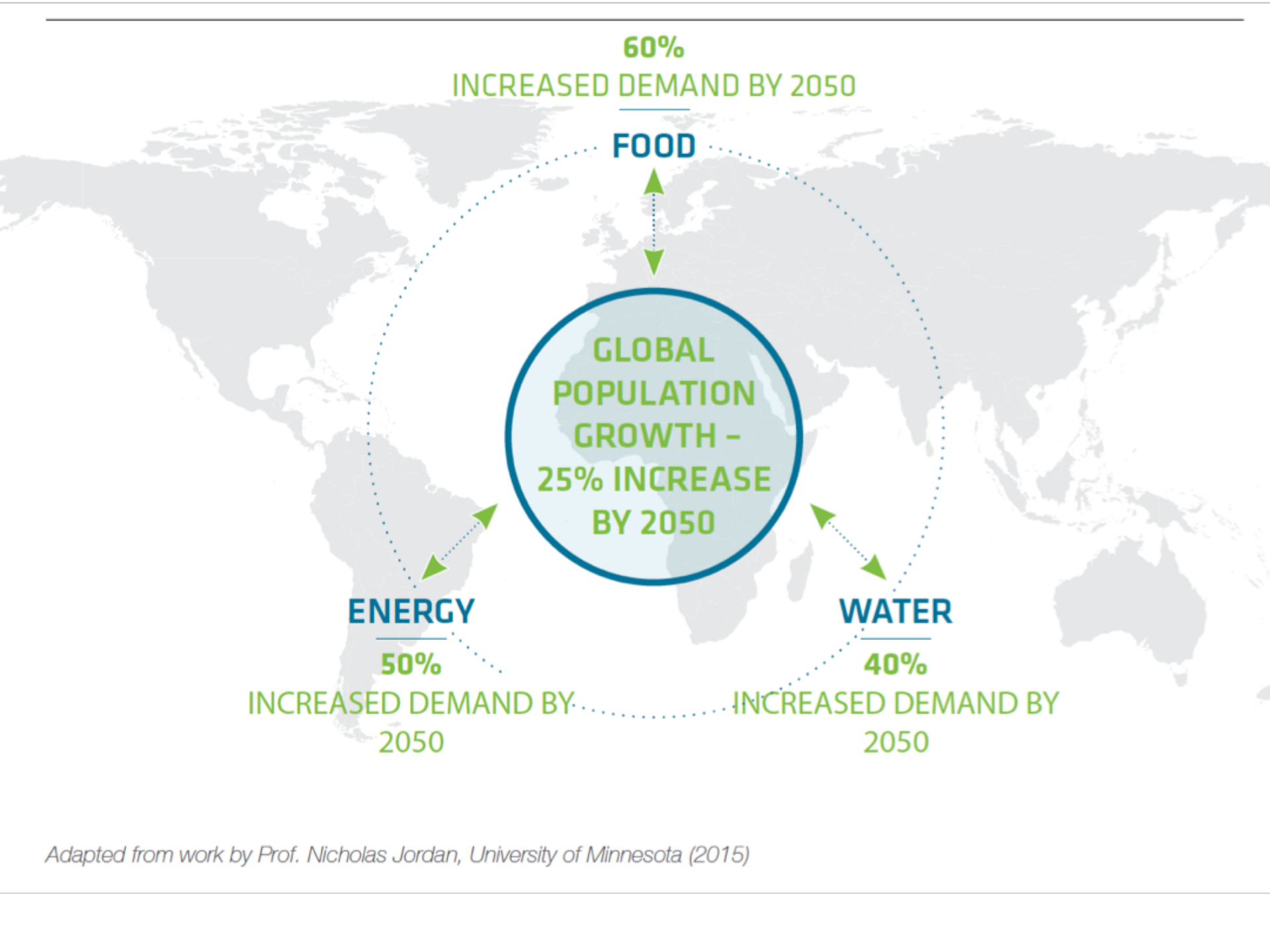
**What does this mean for  
Regional Development?**





# Energy + Water + Food + Changing Climate





**60%**  
INCREASED DEMAND BY 2050

**FOOD**

**GLOBAL  
POPULATION  
GROWTH -  
25% INCREASE  
BY 2050**

**ENERGY**

**50%**  
INCREASED DEMAND BY  
2050

**WATER**

**40%**  
INCREASED DEMAND BY  
2050

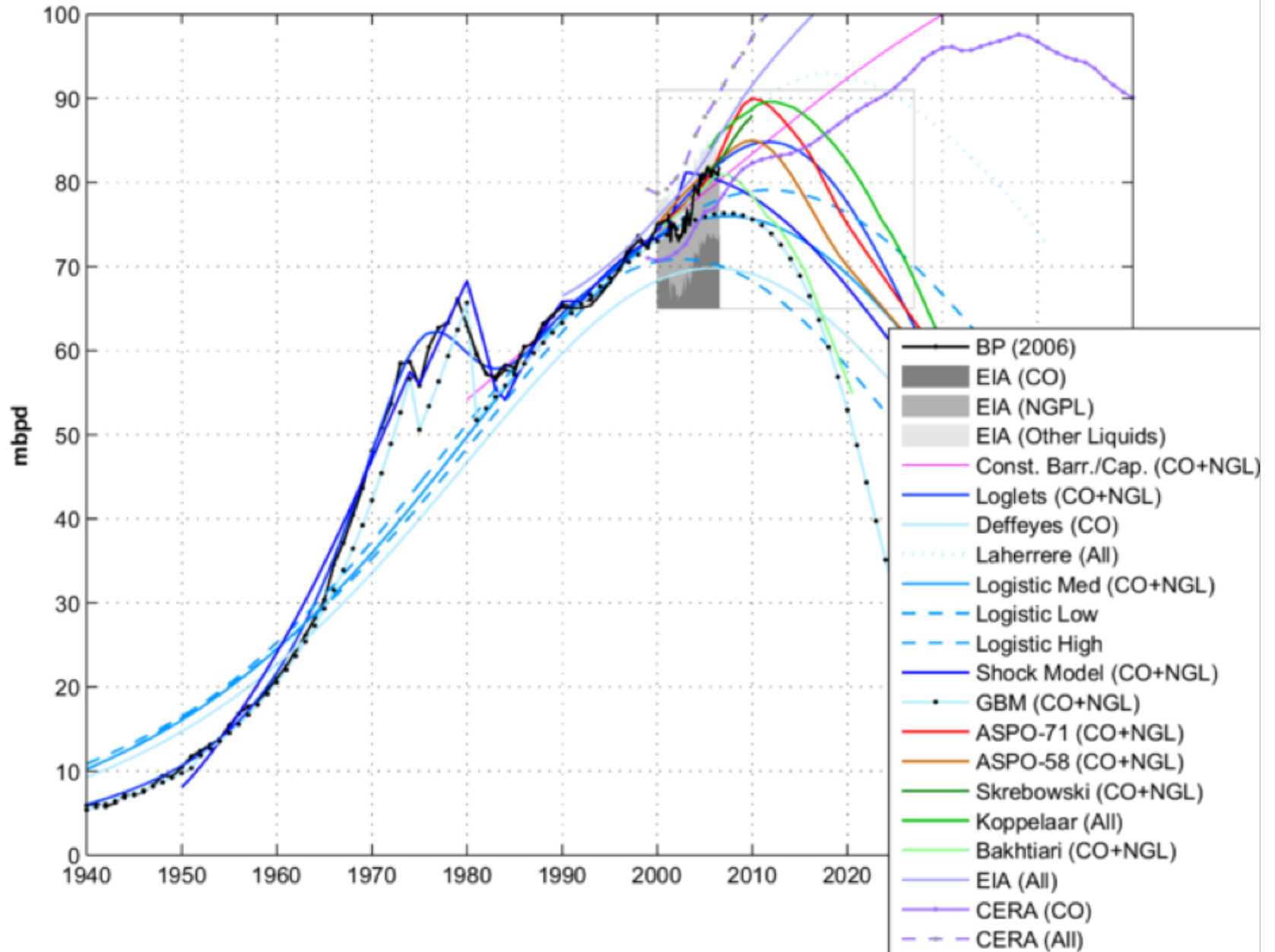
*Adapted from work by Prof. Nicholas Jordan, University of Minnesota (2015)*

# Energy

- **At present 2.5 billion people rely on burning wood and animal dung as their chief source of energy**
- **1.5 billion people have no electricity of any kind.**



### World Production



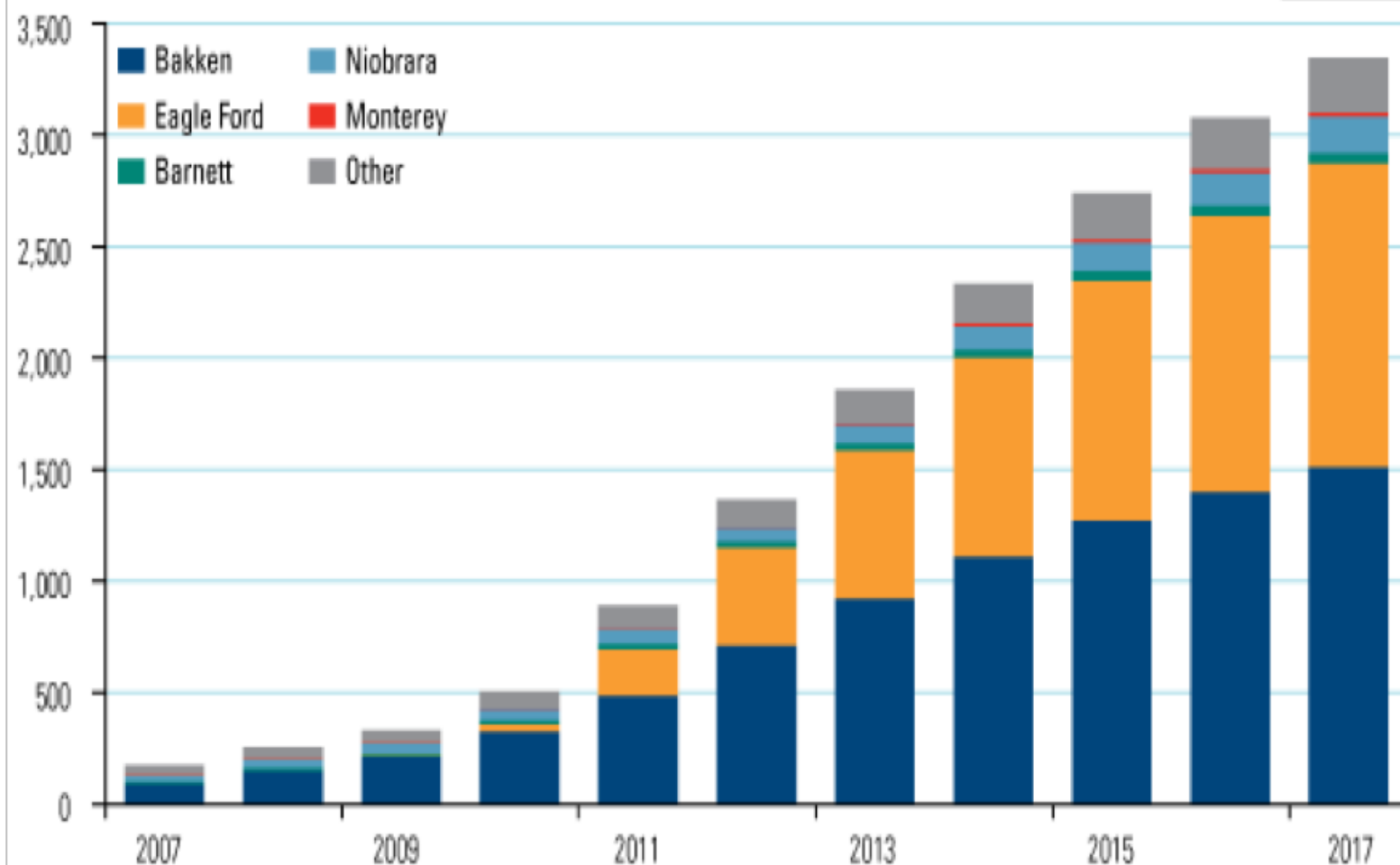


# North American shale plays (as of May 2011)



## U.S. Shale Oil Production Growing

Thousand barrels per day



Source: Woodmac, IEA, EIA, Reuters, company reports, BofA Merrill Lynch Global Commodities Research



# Oil in the U.S.: Rising Supply and Declining Demand

Million barrels per day



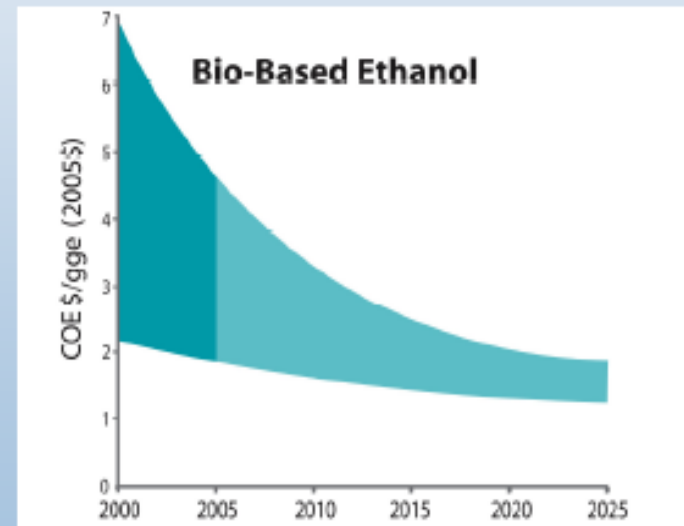
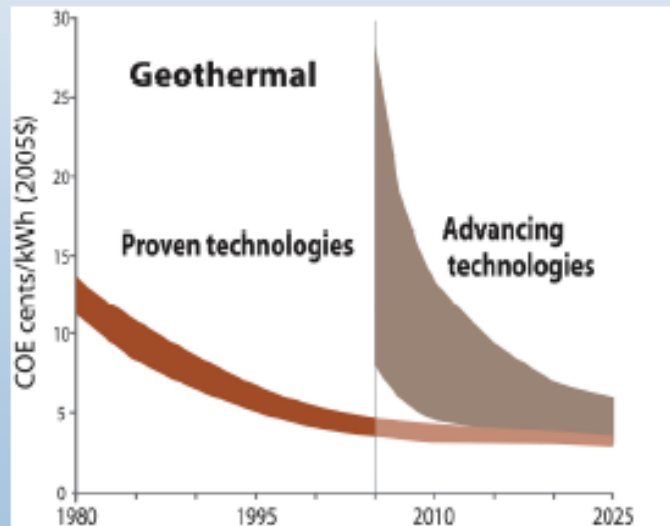
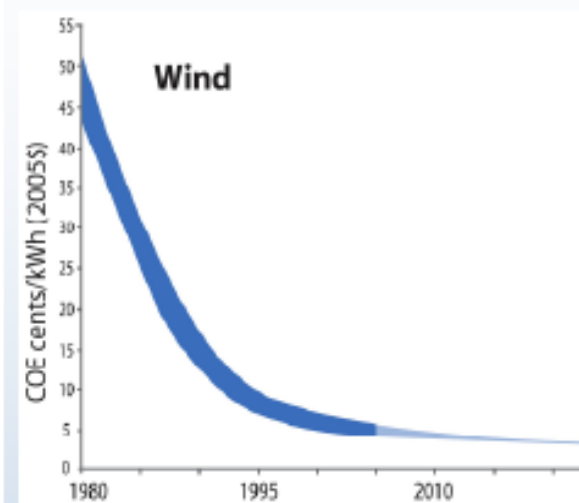
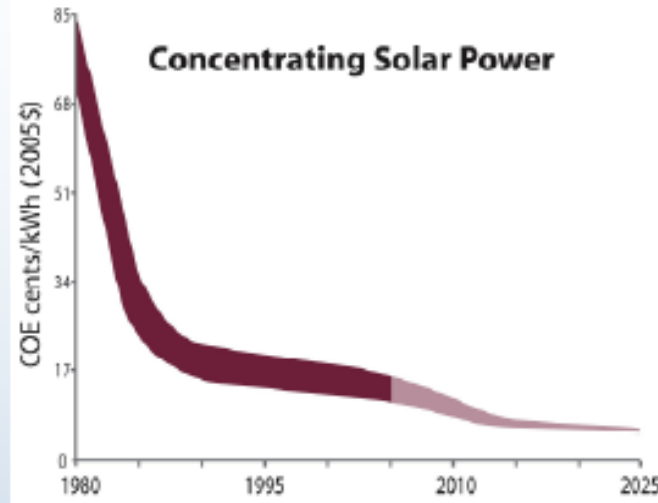
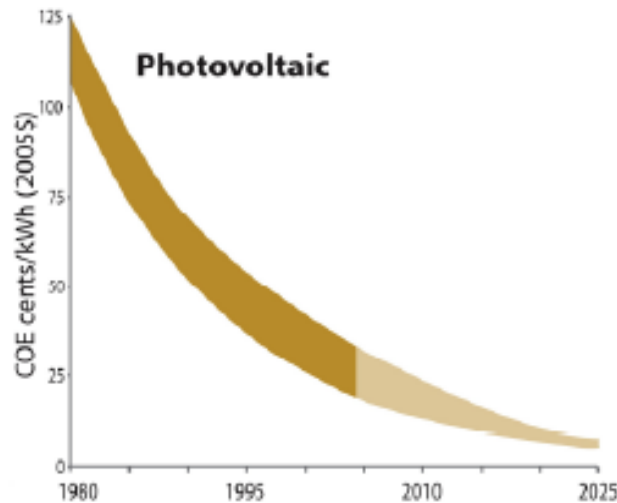
Source: EIA, IEA, Raymond James estimates

# Renewable Energy



# Renewable Energy Cost Trends

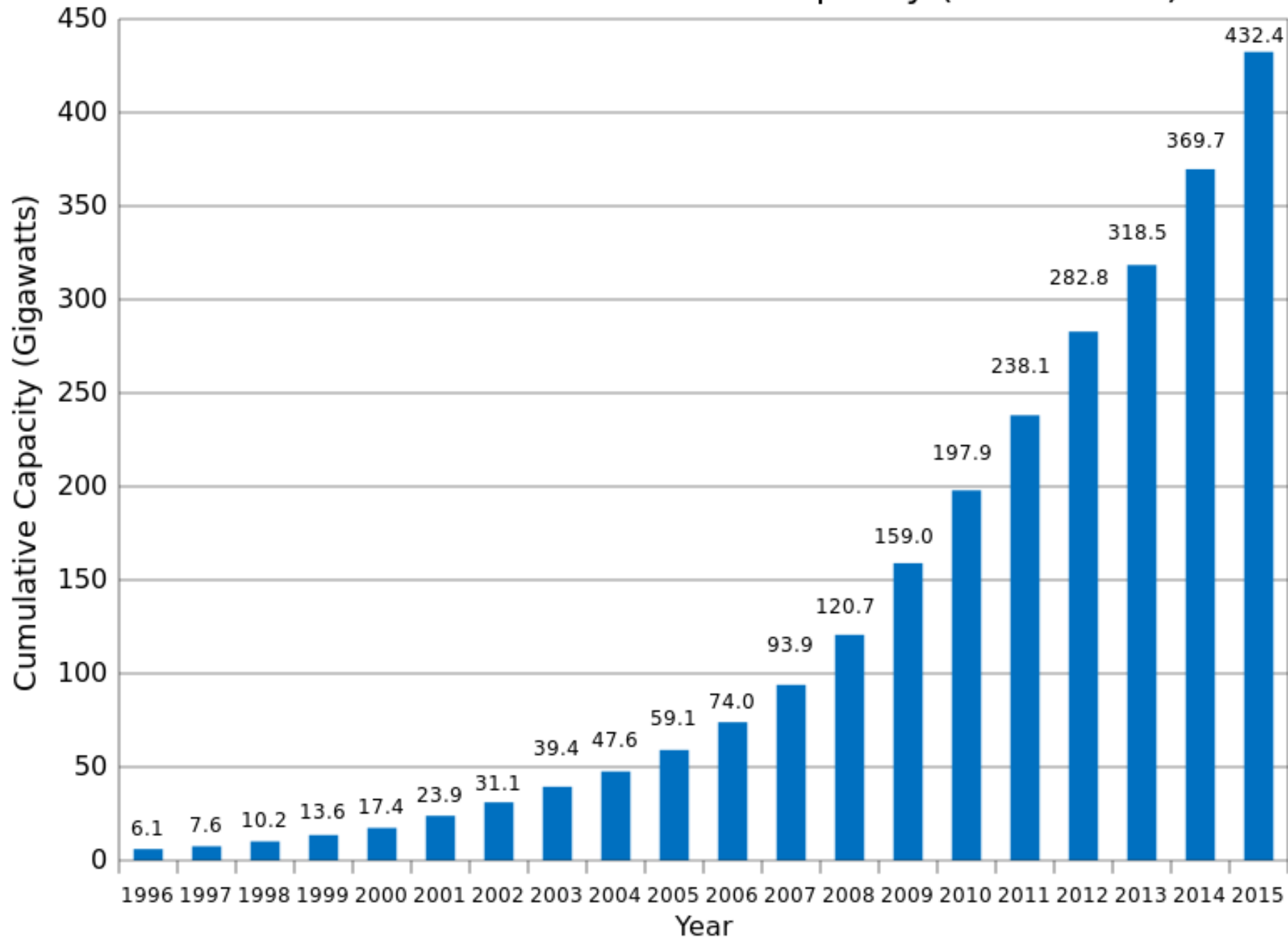
Levelized cost of energy in constant 2005\$<sup>1</sup>



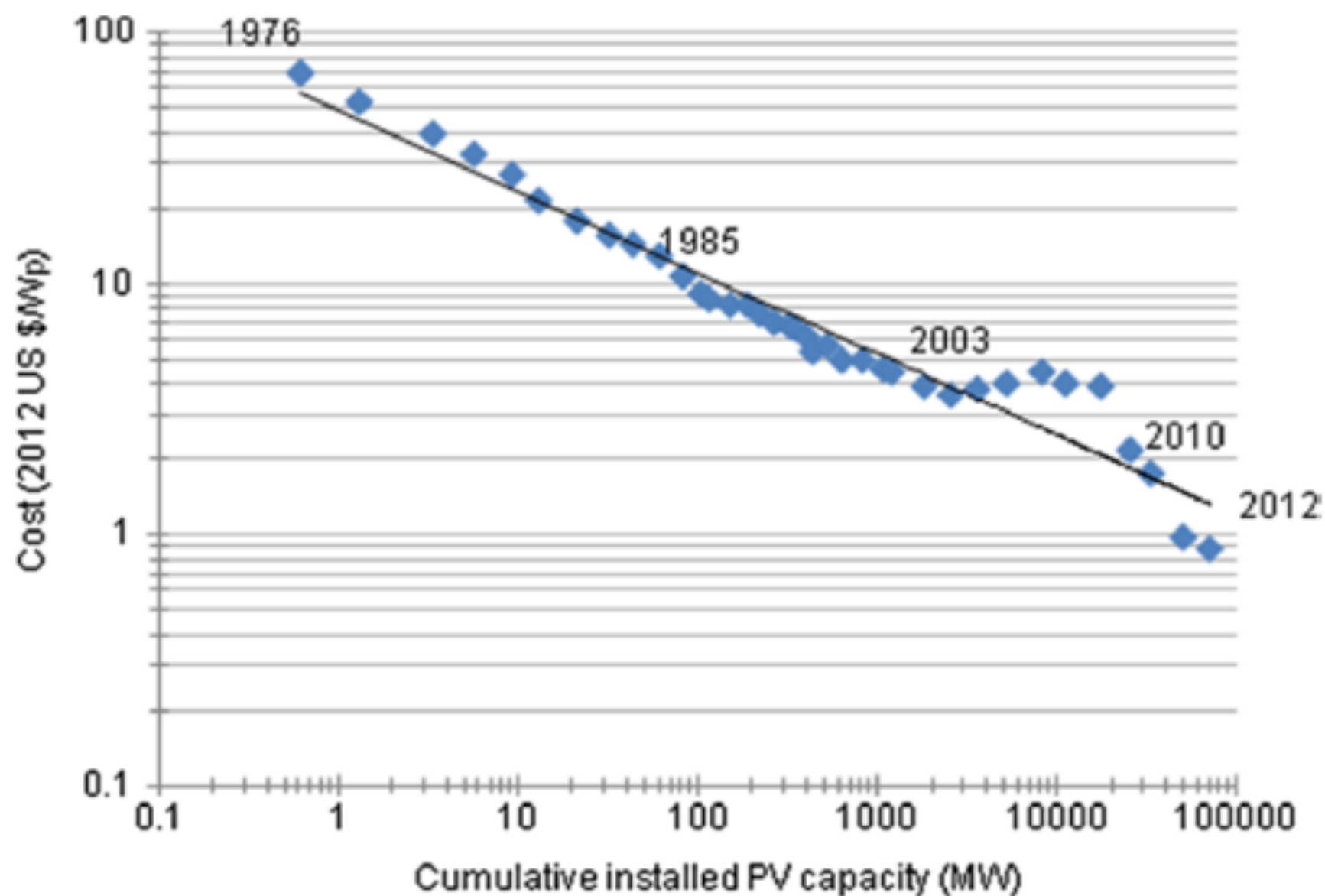
Source: NREL Energy Analysis Office ([www.nrel.gov/analysis/docs/cost\\_curves\\_2005.ppt](http://www.nrel.gov/analysis/docs/cost_curves_2005.ppt))

<sup>1</sup>These graphs are reflections of historical cost trends NOT precise annual historical data. DRAFT November 2005

Global Wind Power Cumulative Capacity (Data:GWEC)



# Solar, blueprint of energy





- 
- The background of the slide is an underwater photograph of a riverbed. The water is clear, revealing a sandy and rocky bottom. There are many thin, brown sticks and twigs scattered across the riverbed, some standing upright and others lying flat. The lighting is natural, coming from above, creating a slightly hazy effect in the water.
- Nearly 450 million people in 29 countries now face severe water shortages
  - As much as 2/3 of the world population could be water-stressed by 2025
  - Half the world's rivers and lakes are seriously polluted

- Irrigation uses 70% of the world's fresh water
- Water scarcity, not lack of arable land, will be the chief constraint to increased food production
- The threat to water resources stands as one of the major crises facing the planet

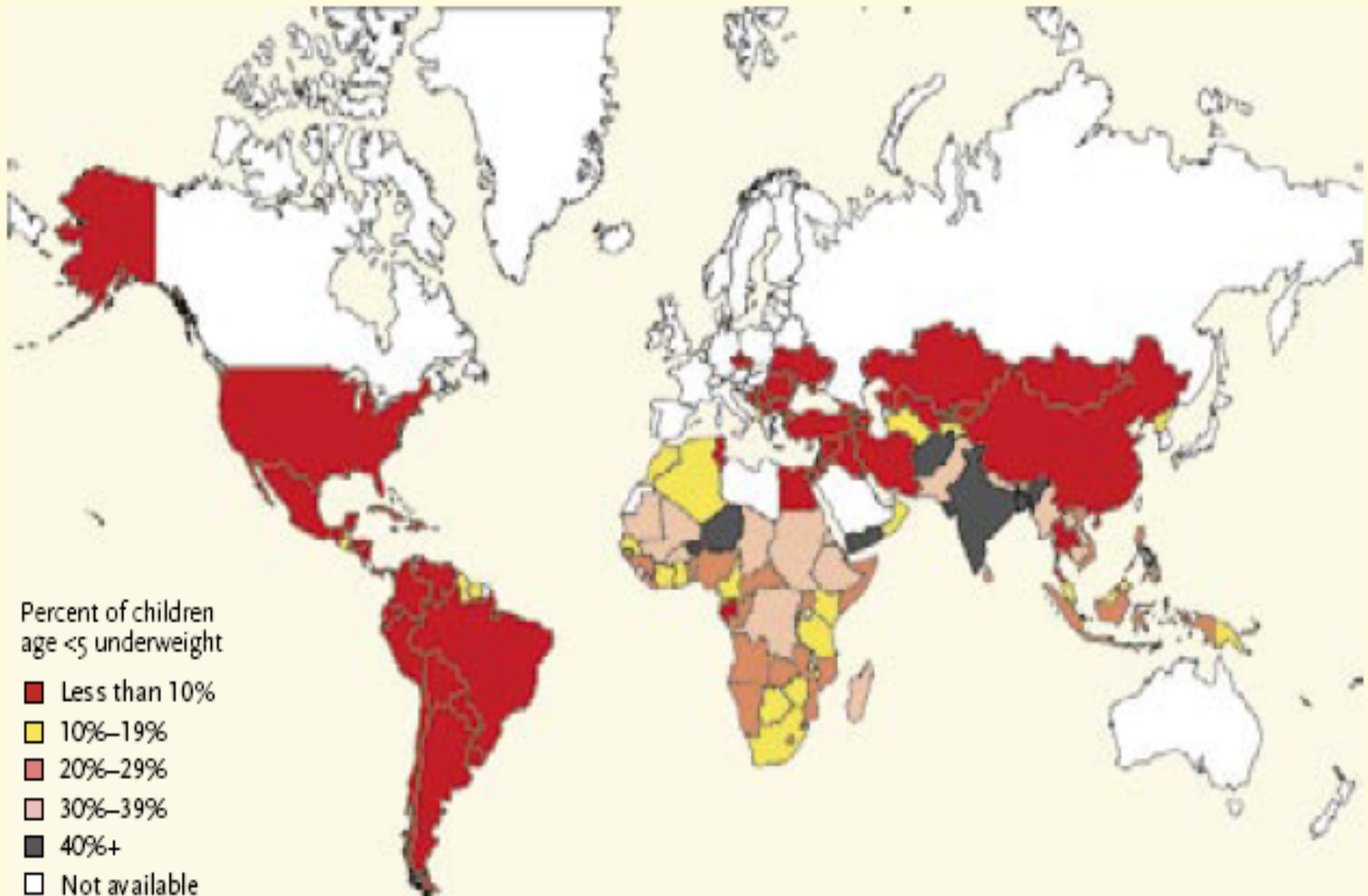
*World Hunger*

*Midwest USA has 20% of global fresh water resources*



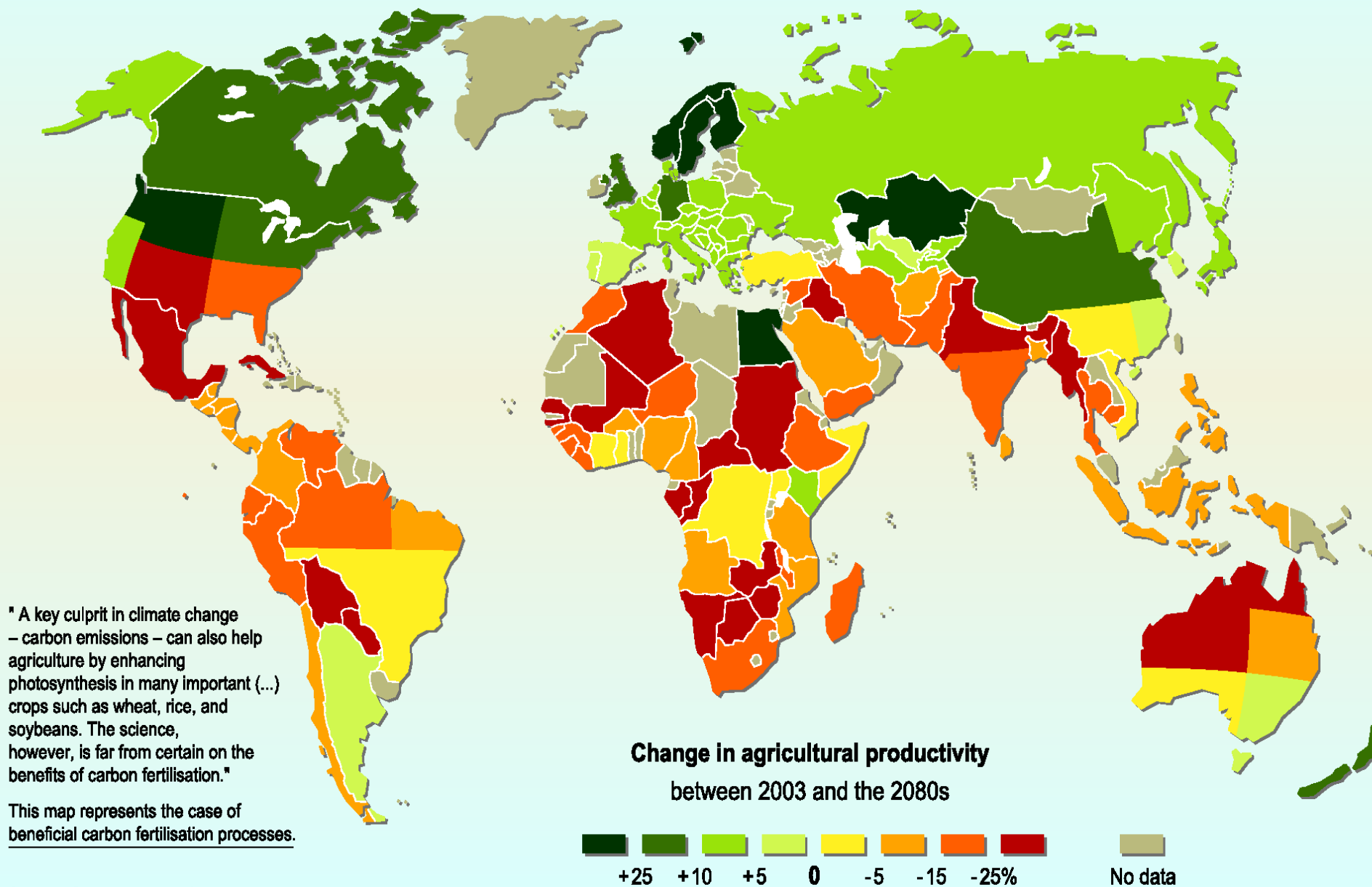


## In Low-Income and Middle-Income Countries, 30 Percent of All Children Are Underweight.

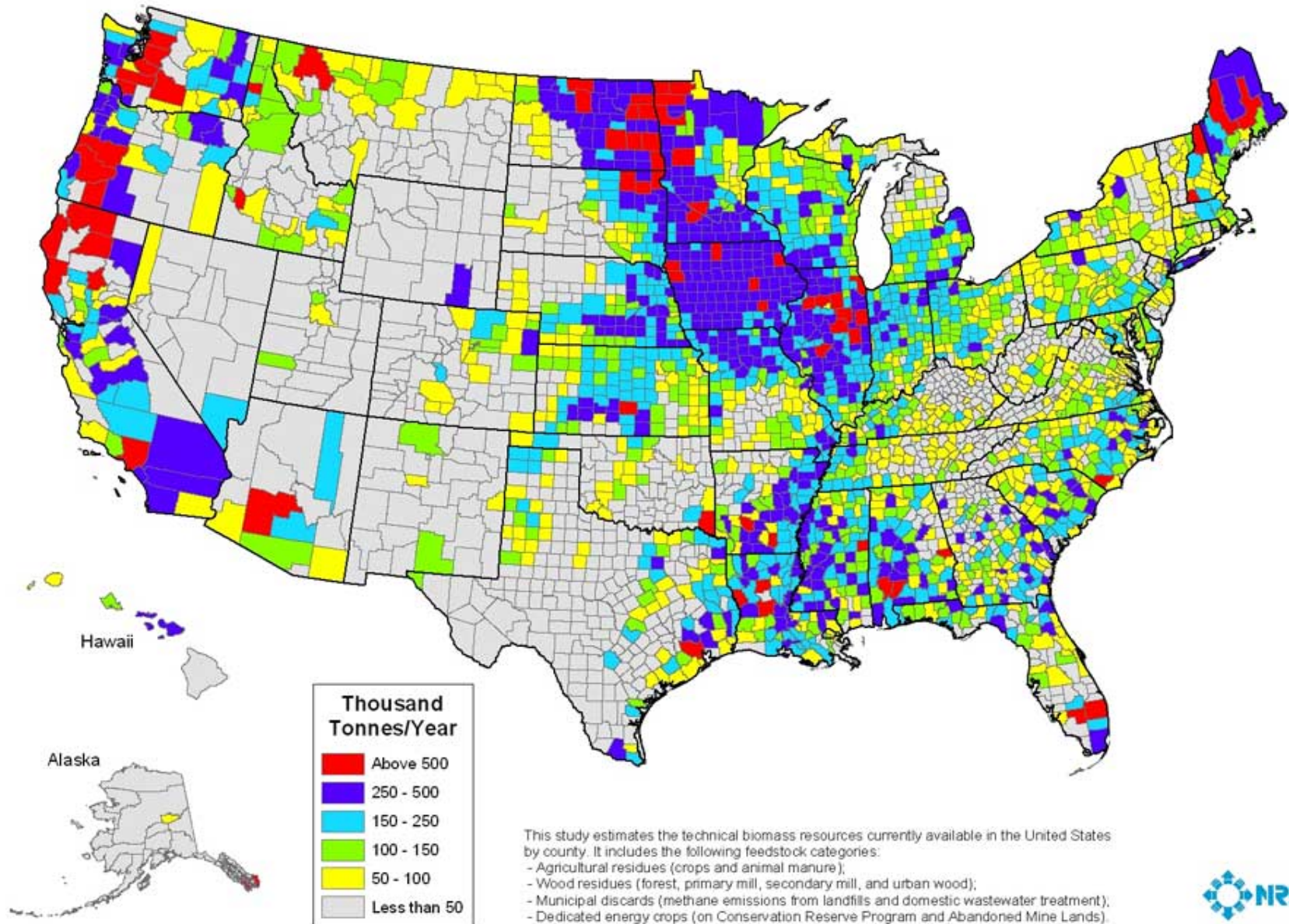


SOURCE: C. Haub, 2007 *World Population Data Sheet*.

# Projected impact of climate change on agricultural yields



## Biomass Resources Available in the United States





# Energy + Water + Food + Changing Climate

- Challenges with finite global resource base
- Uneven impacts of climate change
- Potential for unexpected trends
- Disconnect between where food can be grown, and where it will be consumed

**Energy + Water + Food + Changing Climate**

# **What does this mean for Regional Development?**



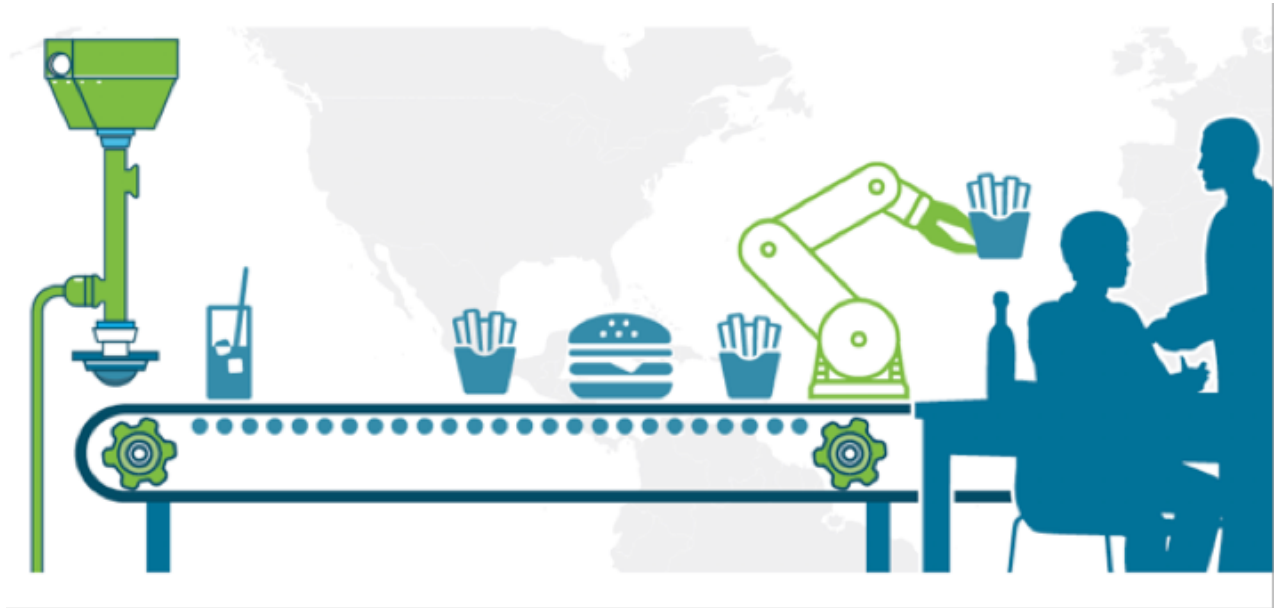
# Technology + Next Industrial Revolution

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# Preparing for the Next Industrial Revolution

Advanced Manufacturing, Robotics and Life Sciences



# Key features of the next industrial revolution

- **Speed of technological change**
- **Drivers at a global scale**





# Technology – a catalyst for change



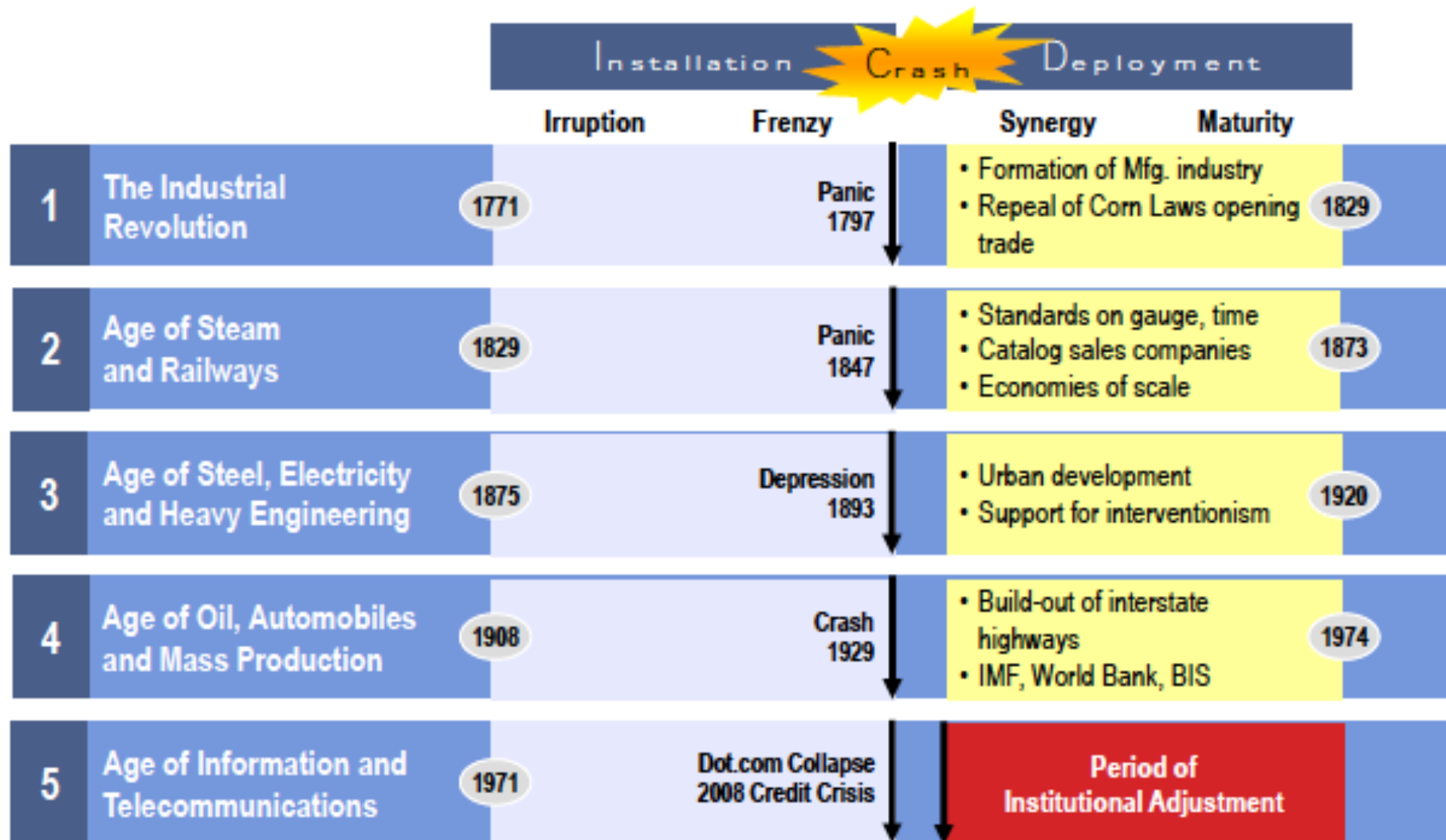
**An analysis of the history of  
technology shows that technological  
change is exponential,**

**Imagine the last 100 years of  
technological change and the  
impacts on our lives.**

**The next 100 years of progress  
in the 21st century.....**

**will be more like 20,000 years  
of progress  
(at today's rate)**

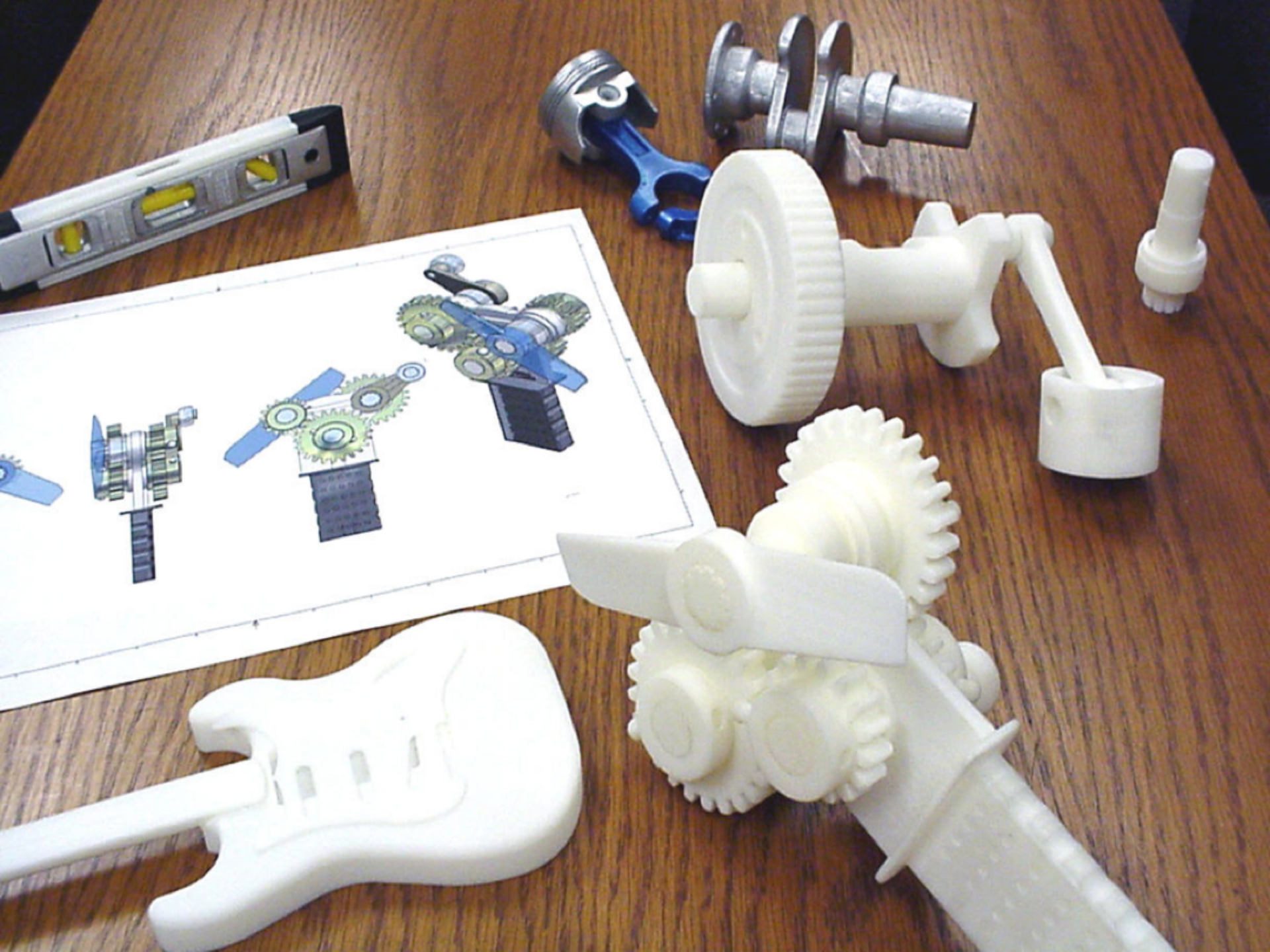
# Five Technological Revolutions in 240 yrs



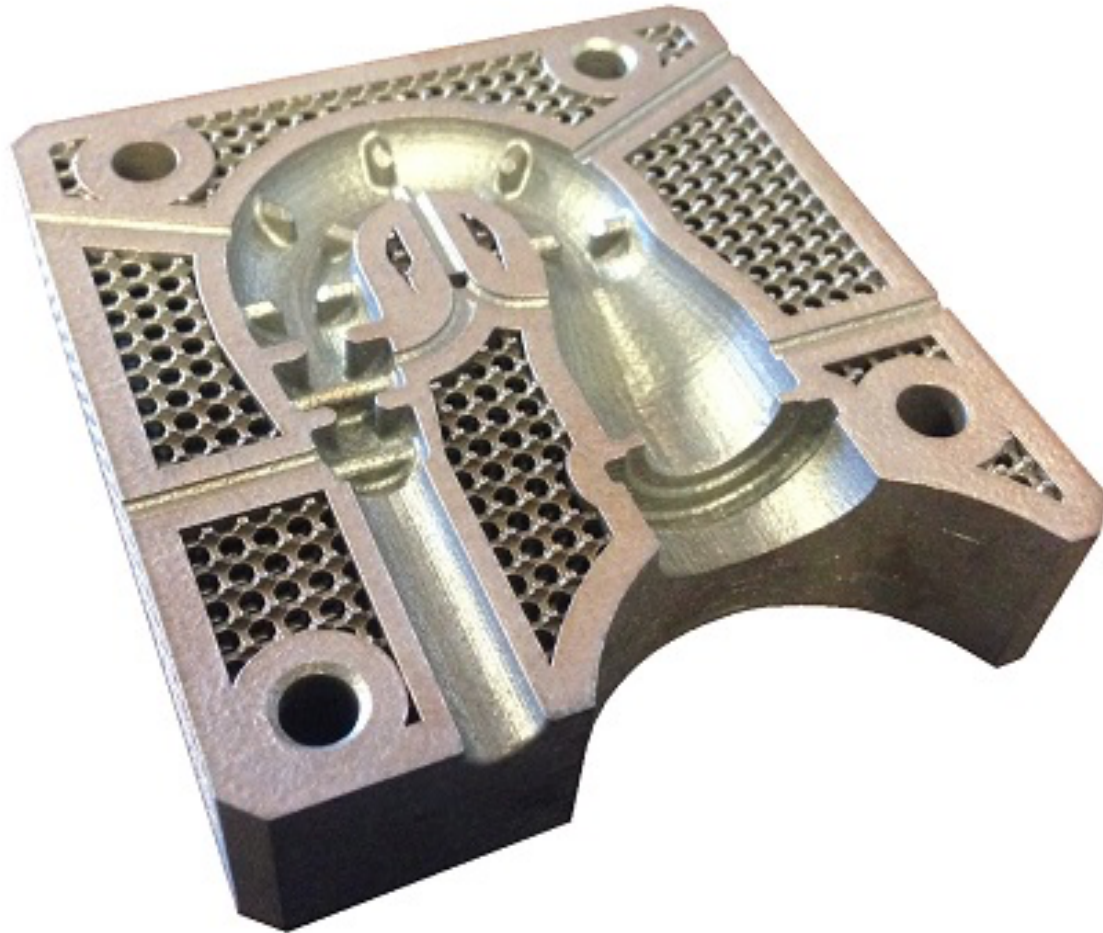
Source: Perez, C., "Technological Revolutions and Financial Capital", 2002

**After 2020 – age of robotics, clean tech and genetics**





**Additive – allowing incredible complexity in design and material composition**





# Complexity and prototyping



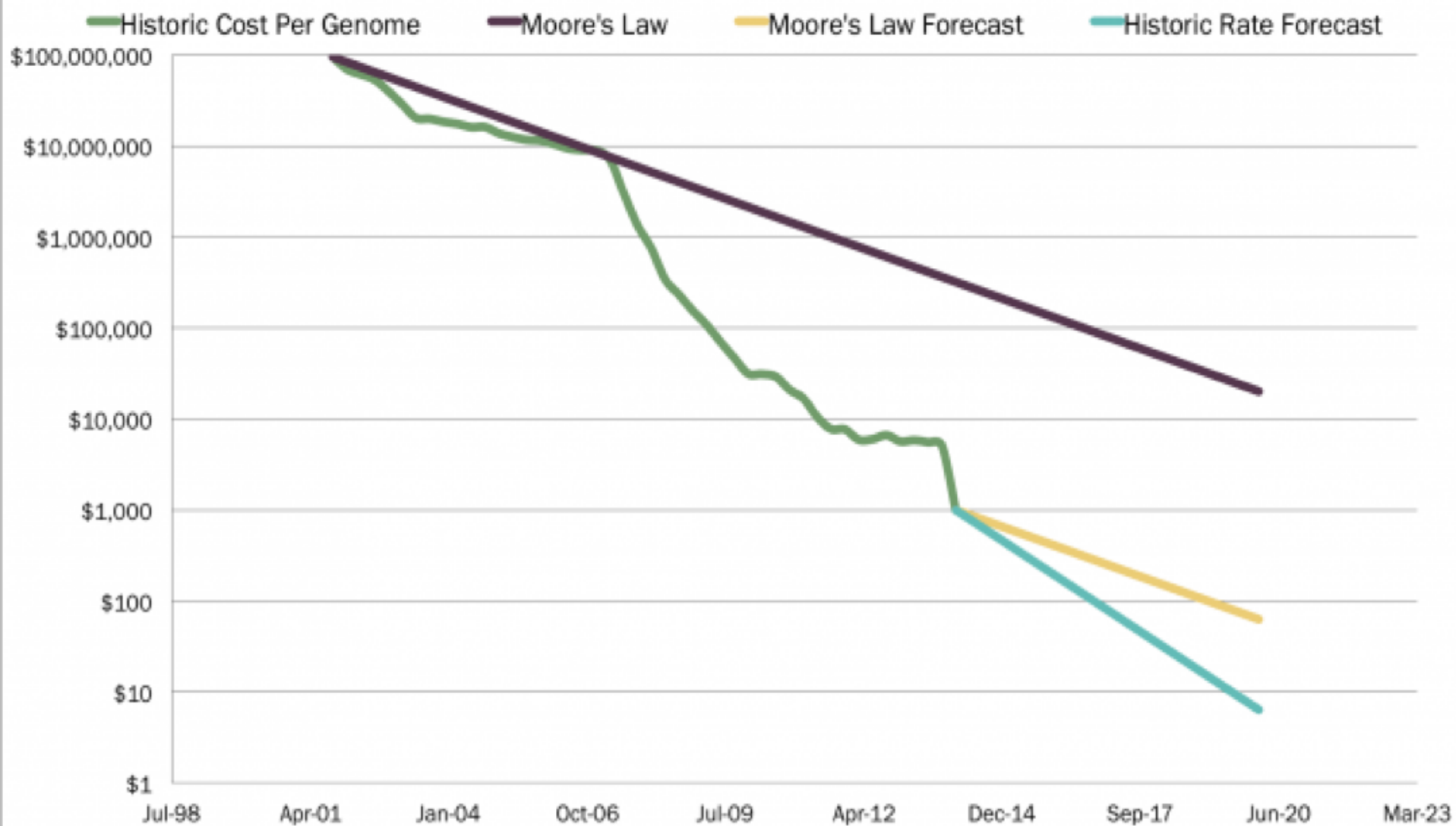
# Technology impact – ‘Mining of the future’



Remote operations centre; mines thousands of kilometers away



## Cost Declines of Genome Sequencing



# What makes this industrial revolution different?

- Machine learning / Artificial Intelligence
- Converging technologies
- Exponential impacts





## Technological Development

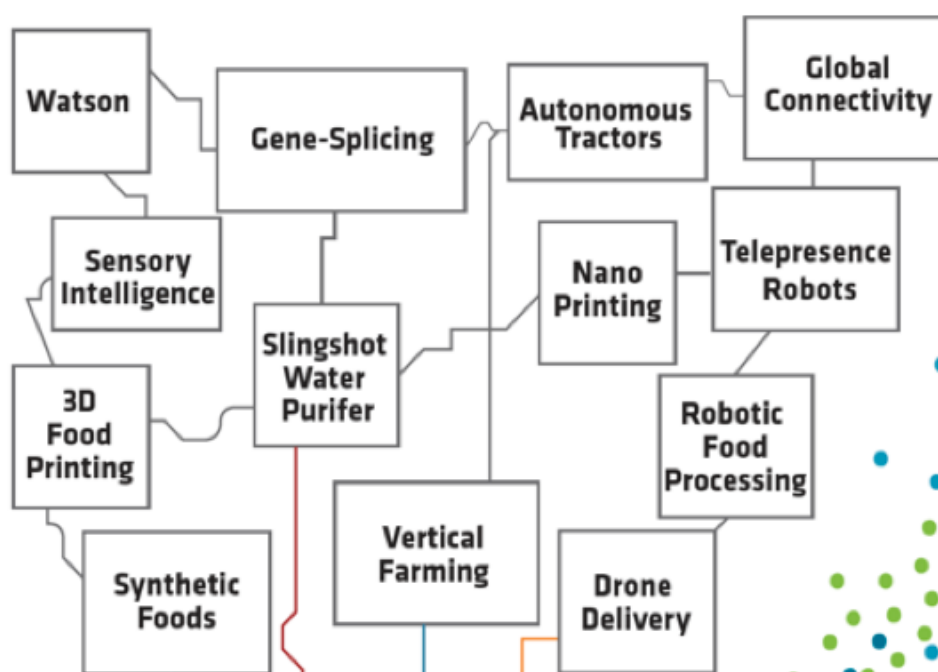
Moore's Law: The power of chips, bandwidth and computer doubles appr. every 18 months.

## The Human Factor

Technological dev. feeds and enables various trends in society: Democratisation, Social Connection, DIY, Decentralisation.

EXPONENTIAL TECHNOLOGIES

Biotech  
Neurotech  
Nanotech  
New Energy & Sustainability  
ICT & Mobile Technology  
Sensing  
3D Food Printing  
Artificial Intelligence  
Robotics  
Drones



FROM LINEAR  
TO EXPONENTIAL  
GROWTH TRAJECTORY



# Technology + Next Industrial Revolution

- Impacting every corner of our lives
- Capacity to radically disrupt systems
- Changes in where things will be made
- New materials and new products

**Technology - driving and enabling  
accelerated change**

# **What does this mean for Regional Development?**

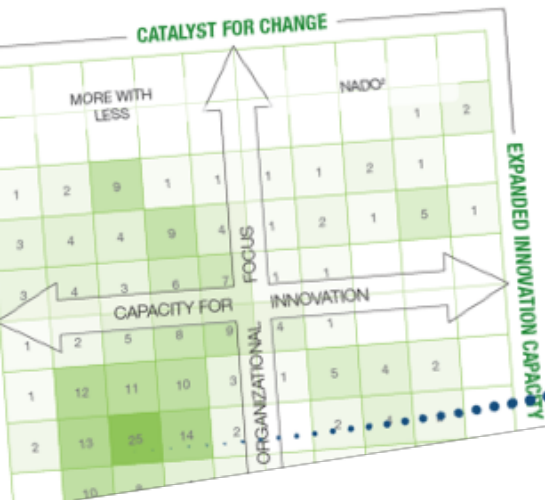


# **Combined - what does all this mean for Strategic Planning for NADO?**



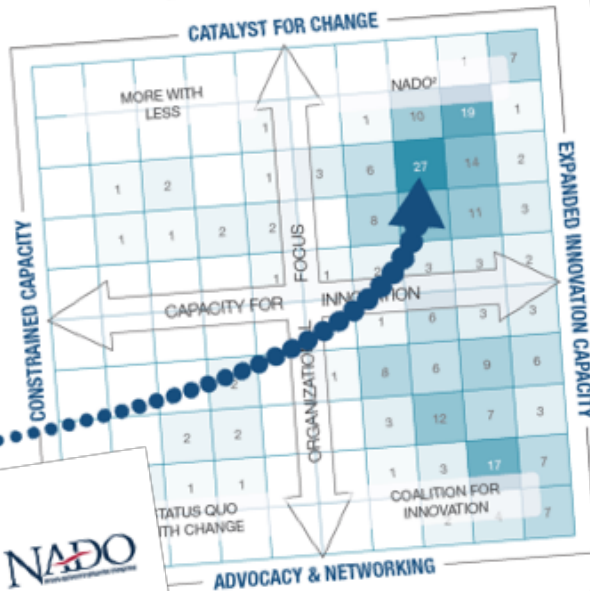
# NADO SCENARIO PLANNING THINK TANK

EXPECTED FUTURE - 2030



# NADO SCENARIO PLANNING THINK TANK

EXPECTED FUTURE - 2030



future*iq* NADO

## NATIONAL ASSOCIATION OF DEVELOPMENT ORGANIZATIONS

SCENARIO-BASED THINK TANK

June 2nd, 2018

NADO  
NATIONAL ASSOCIATION OF DEVELOPMENT ORGANIZATIONS



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# **‘The Future of Regions’ Implications for NADO**

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