



Singapore at 50:  
What lies ahead?  
**2-3 July 2015**  
**Shangri-La Hotel**

## **SESSION THREE**

# **The City: Energy, the Environment and Resilience**

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The Salesforce logo, which consists of the word "salesforce" in a white, lowercase, sans-serif font, enclosed within a blue, cloud-like shape with rounded, irregular edges.

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THE CUSTOMER SUCCESS PLATFORM

# Free Riding, or Great Transformation?

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Peter Schwartz

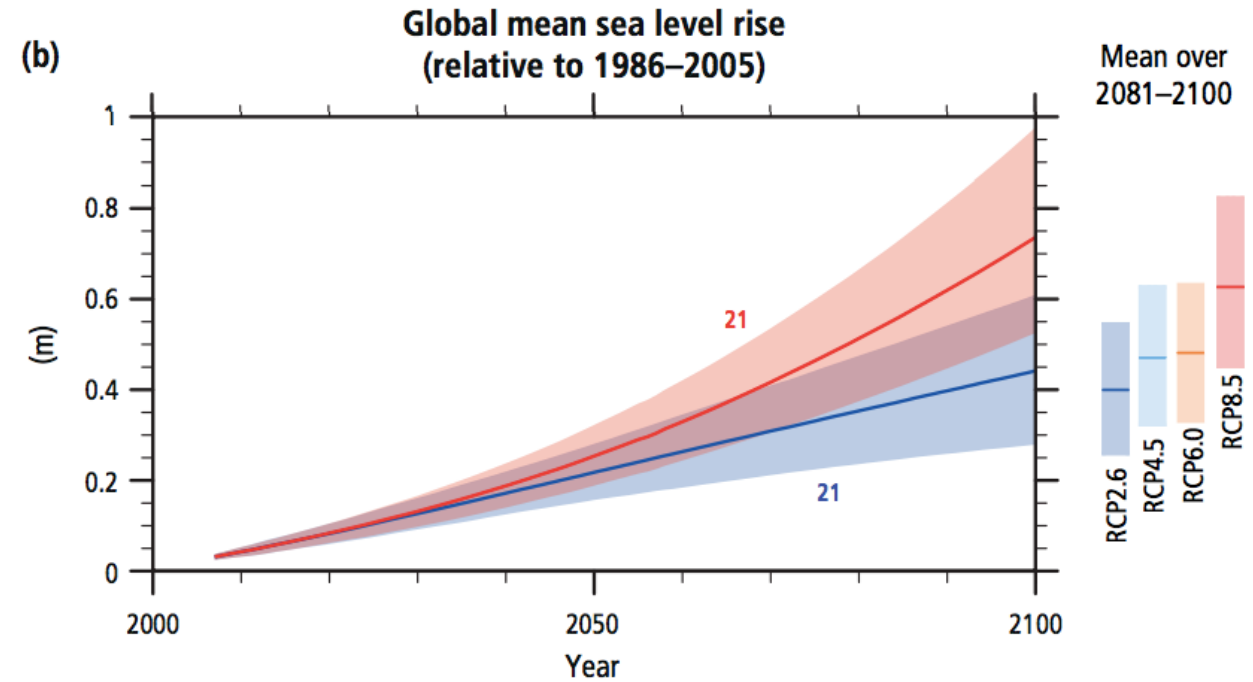
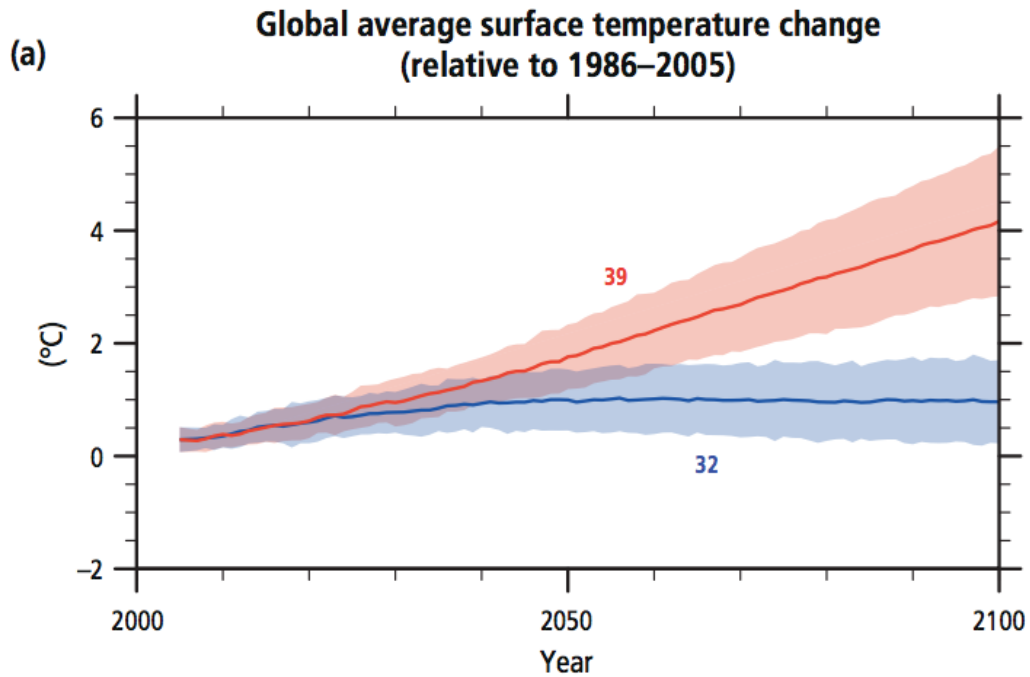
SVP, Strategic Planning

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# Energy and Climate Change are Closely Connected via CO<sub>2</sub>

Sea levels are certain to rise through the century; question is how much



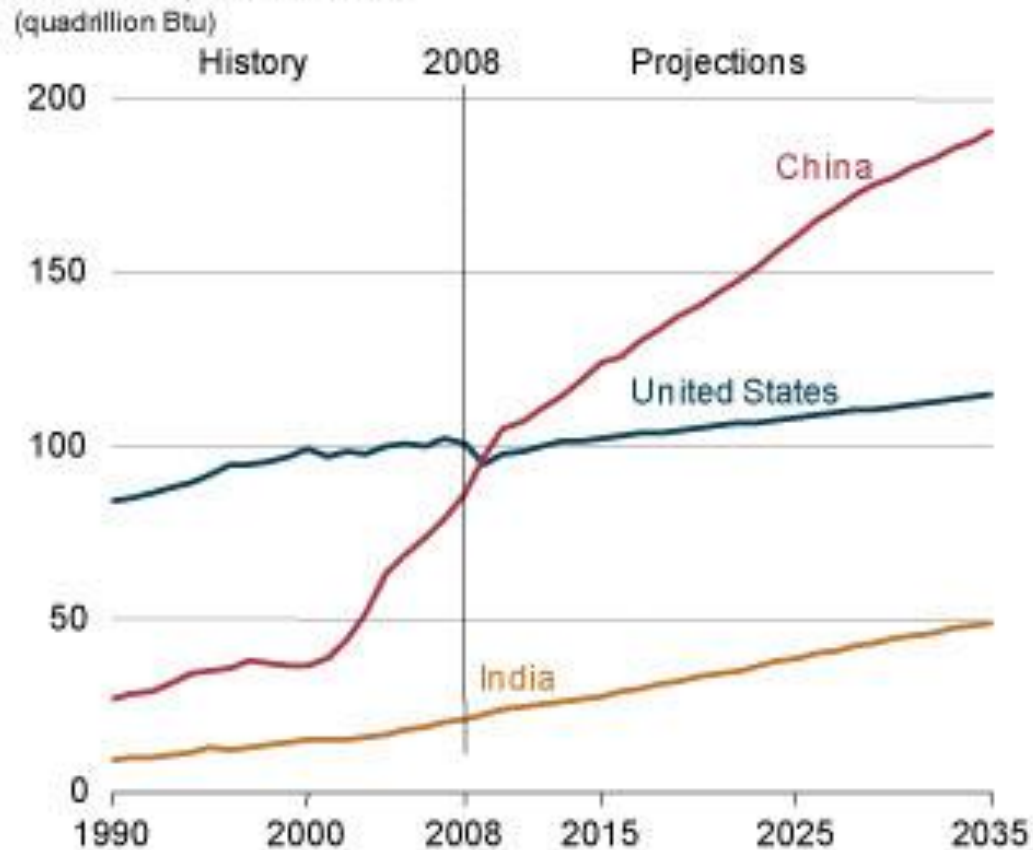
# Protective Measures Are Needed



# What is Now Conventional Wisdom on the Future of Energy

Rising demand in mostly emerging markets

Figure 13. Energy consumption in the United States, China, and India, 1990-2035  
(quadrillion Btu)



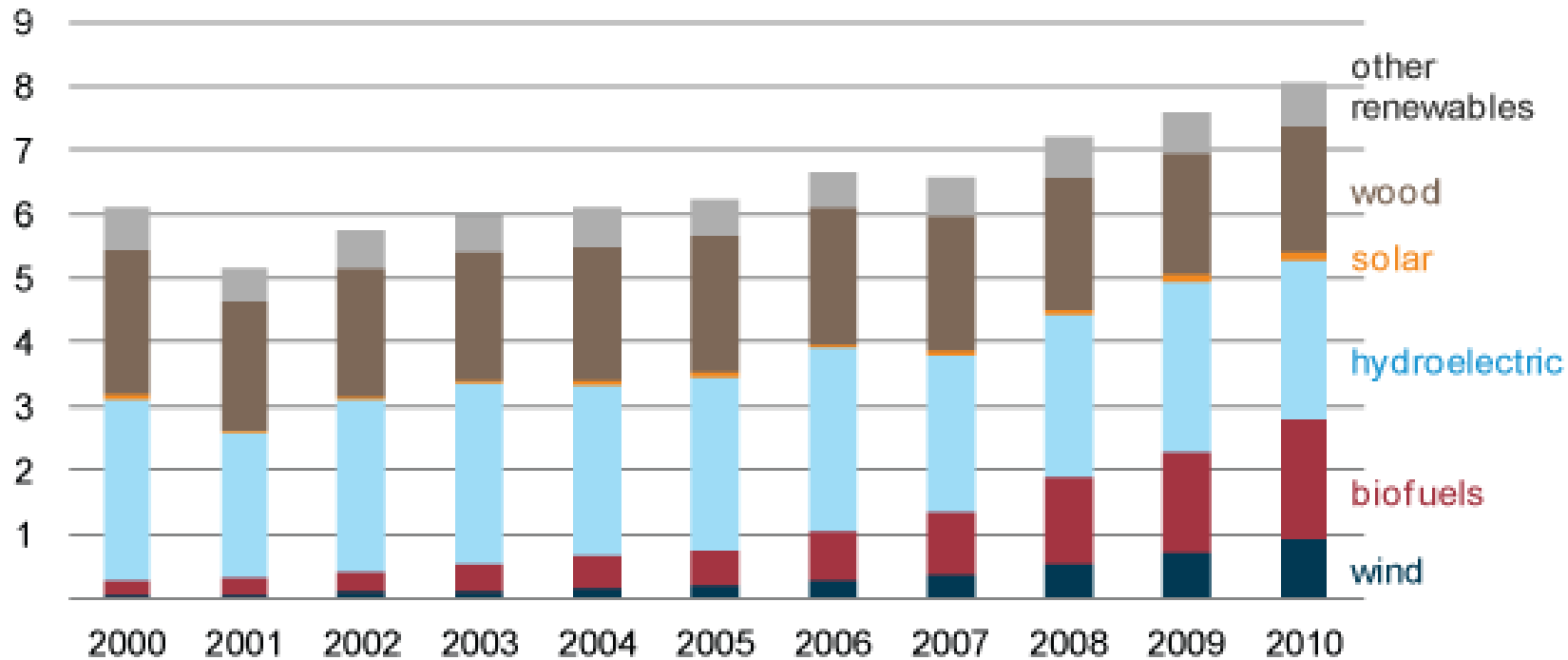
# What is Now Conventional Wisdom on the Future of Energy

Movement away from hydrocarbons for cost and environmental reasons

## Use of U.S. wind and biofuels on the rise

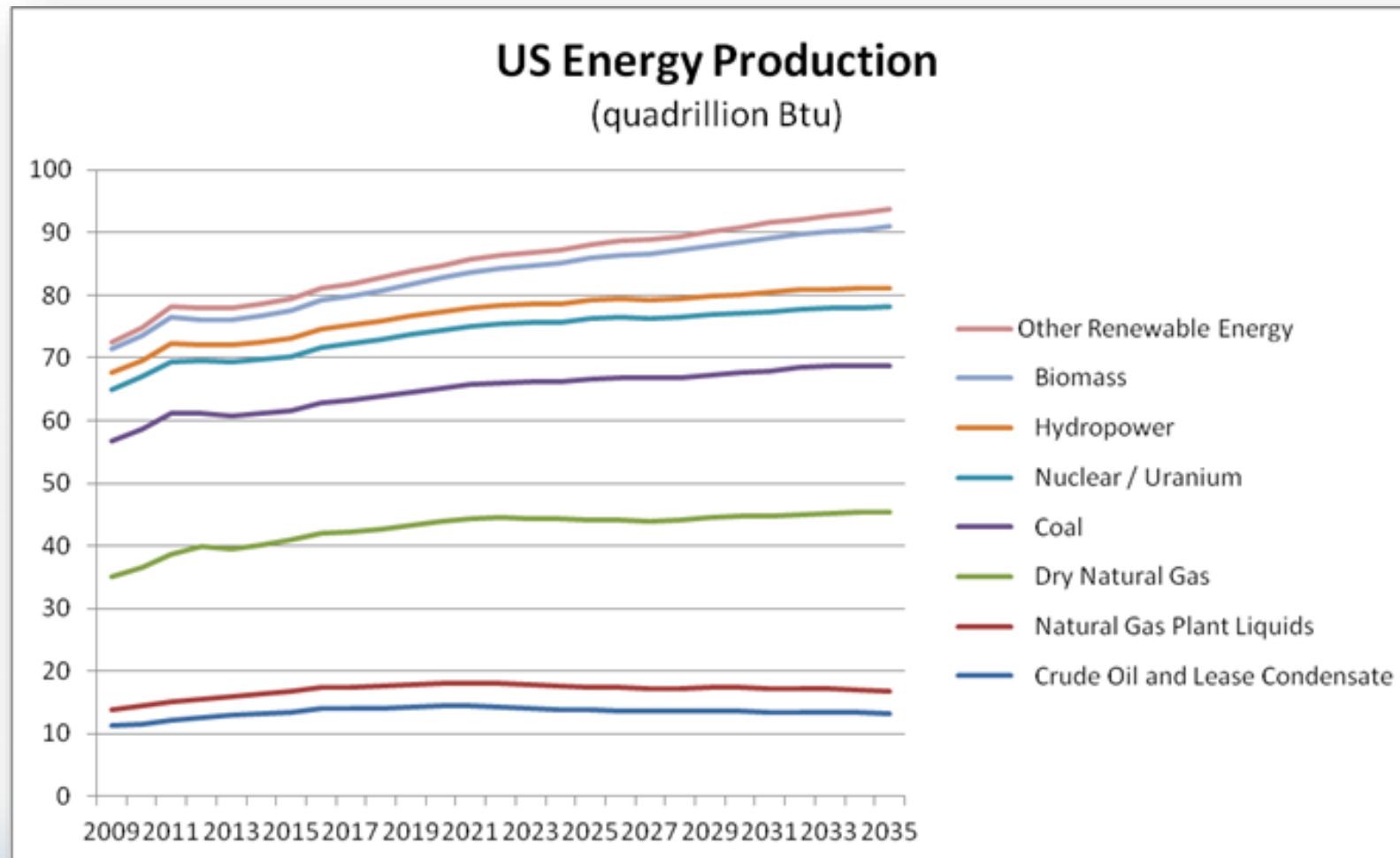
Renewable energy consumption by primary energy source, 2000-2010

quadrillion British thermal units



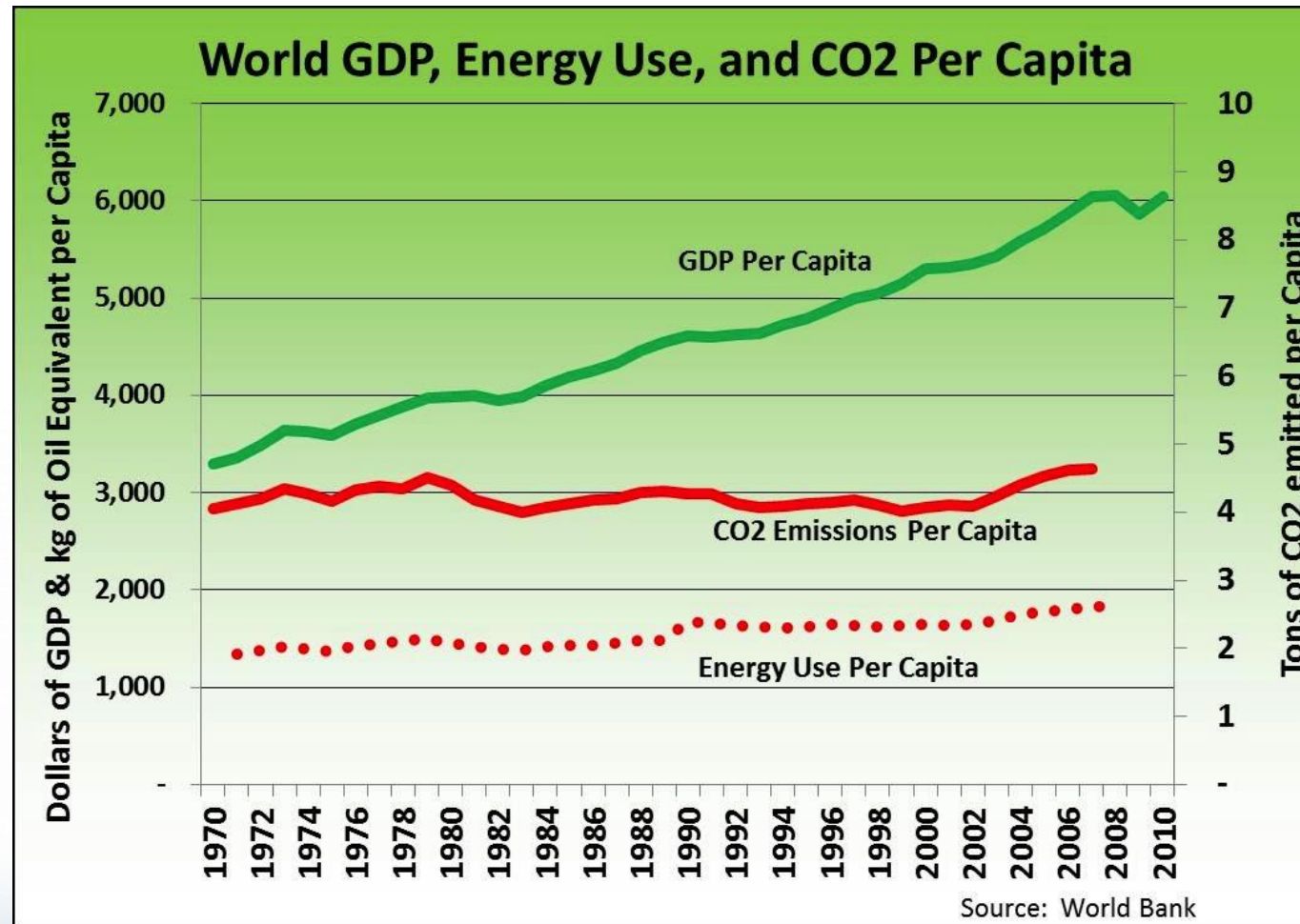
# What is Now Conventional Wisdom on the Future of Energy

More coal and a bit of nuclear



# The World Economy is Becoming Less Energy Intense

But relative decoupling is not enough – economic growth still increases emissions





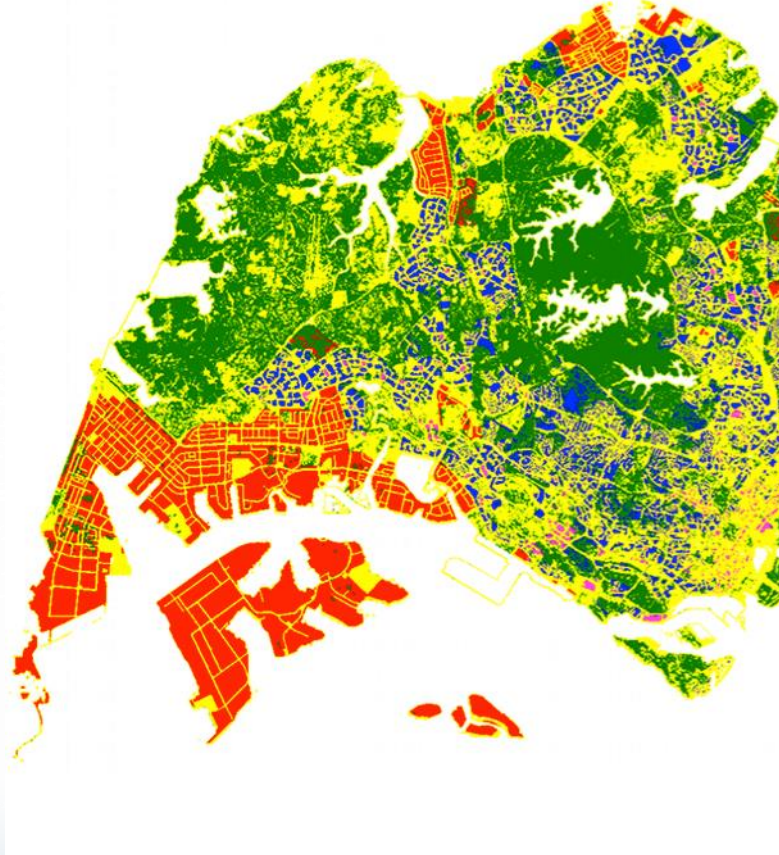
# The Biggest Lever on Decarbonization is Demand

A combination of interventions can radically reduce energy use

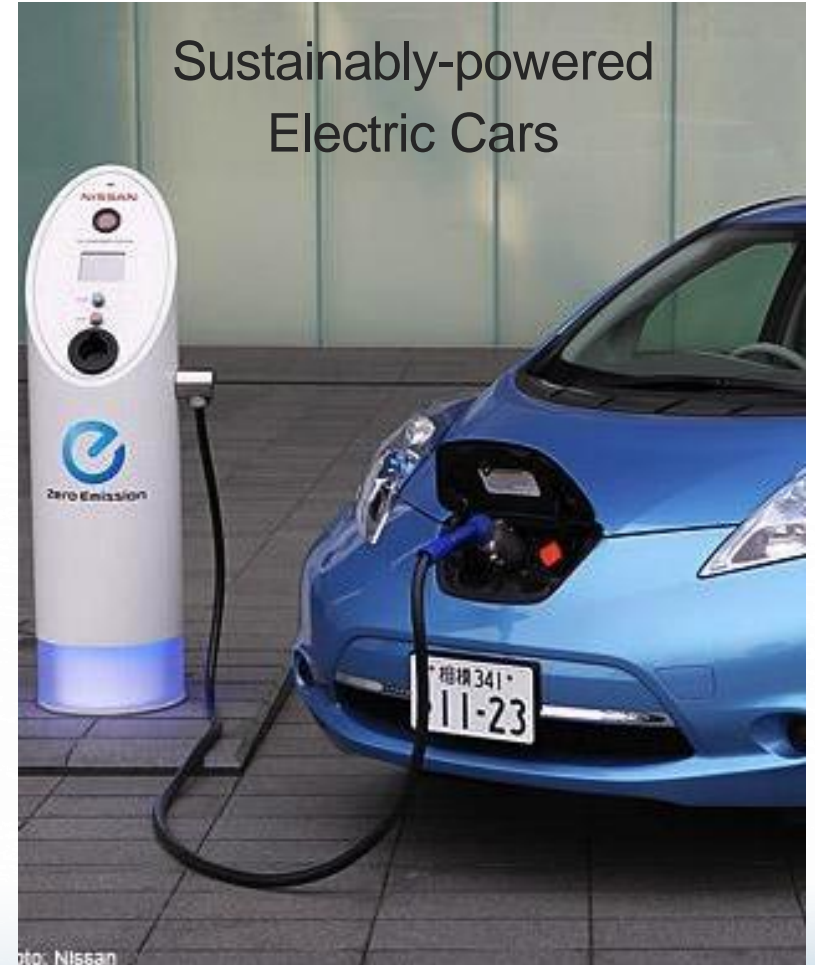
Efficient Buildings



Improved Land Use



Sustainably-powered  
Electric Cars



# Potential Game Changers

Any of these could rapidly shift the calculus

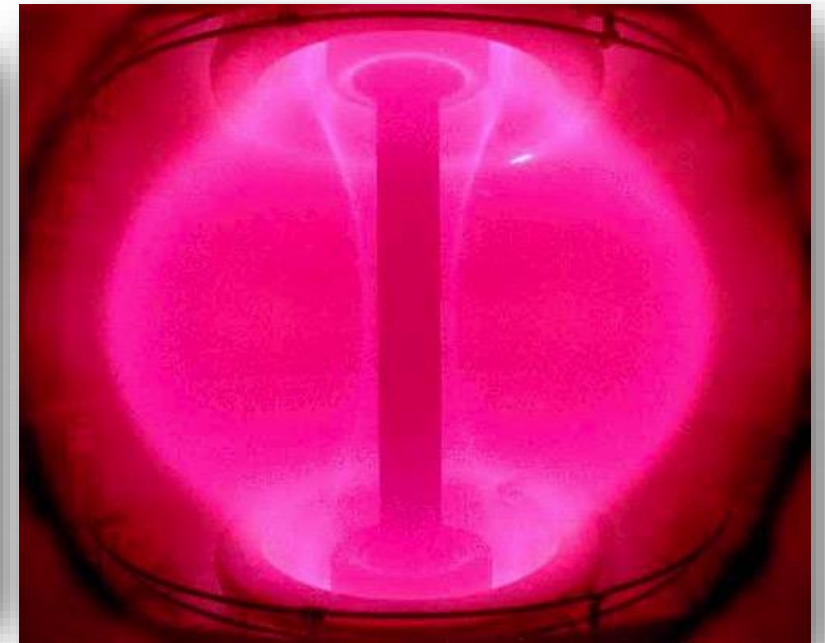
Scalable Carbon Capture



Cheap Solar + Storage

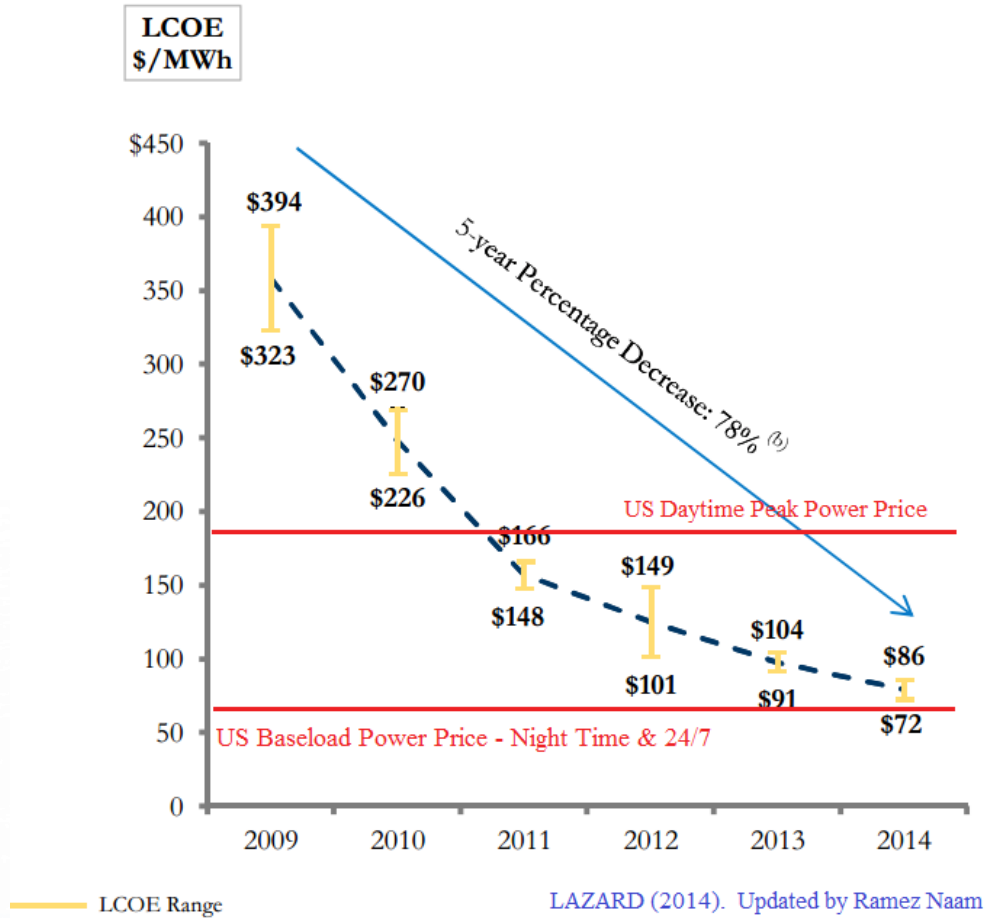


Fusion

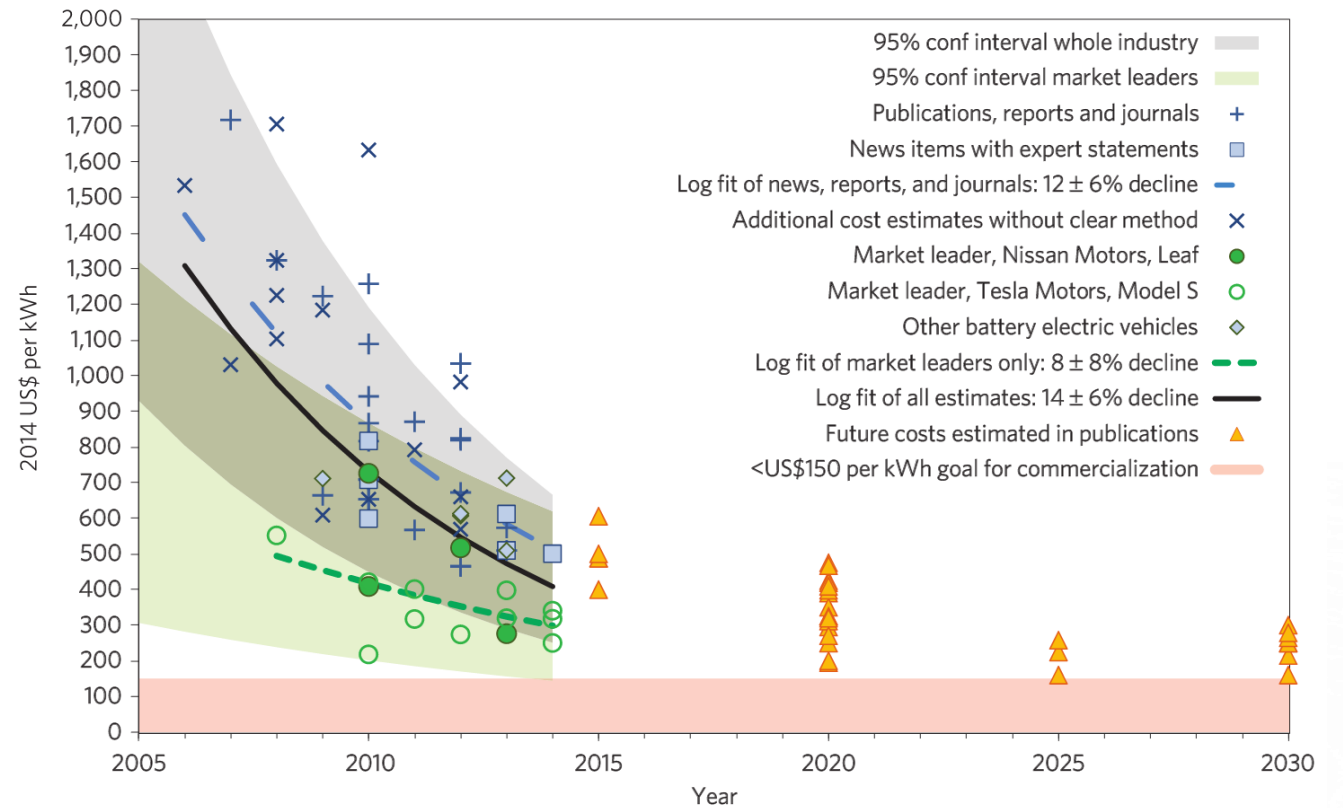


# Solar Is Getting Cheaper, and So Is Storage

But are these rates of change sustainable and scalable?



Solar PV Cost



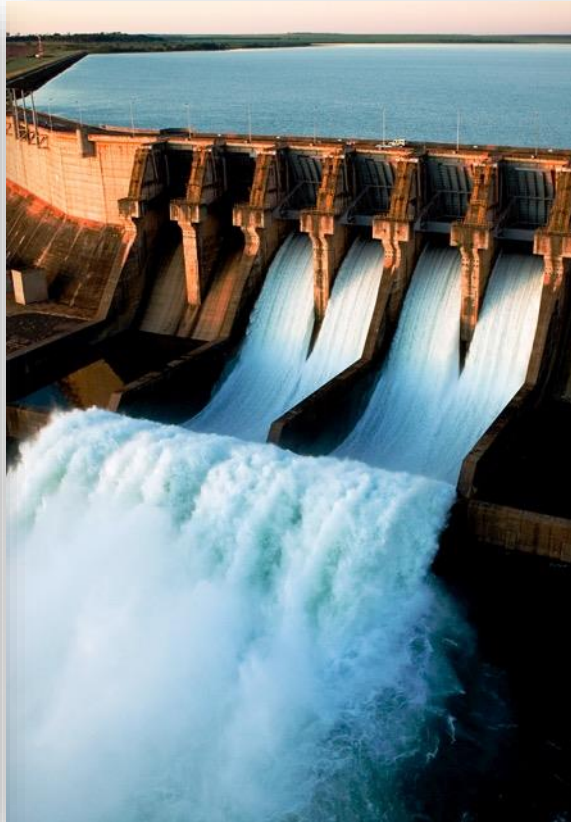
Li-ion Battery Cost

# Most Sustainable, Non-Emitting Sources Face Challenges

Few realistic options exist for a small island nation



Solar is expensive & demands large land area



Hydro depends on untapped water sources



Wind requires large, open water or land areas



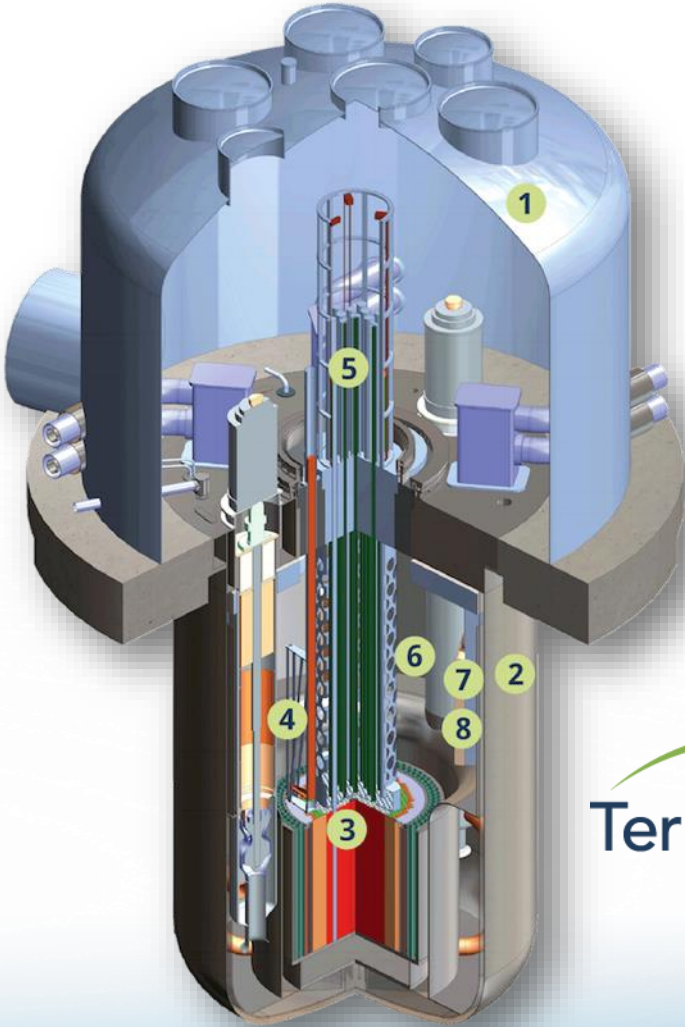
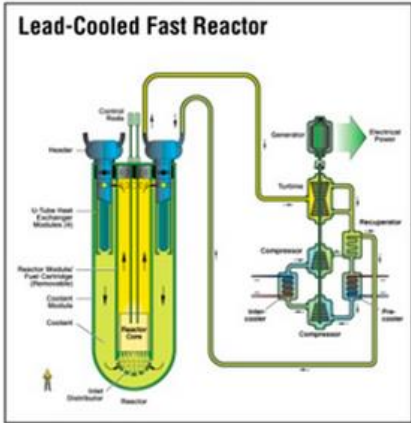
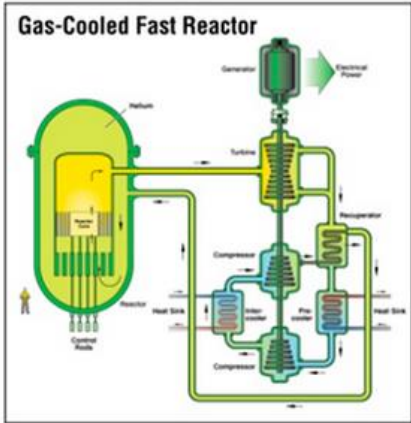
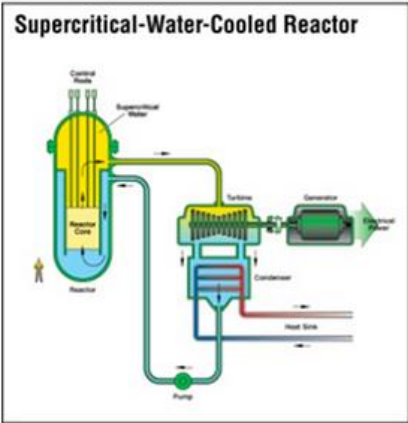
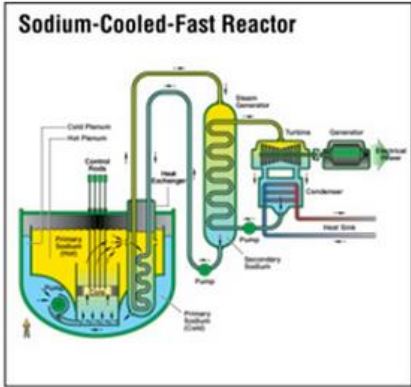
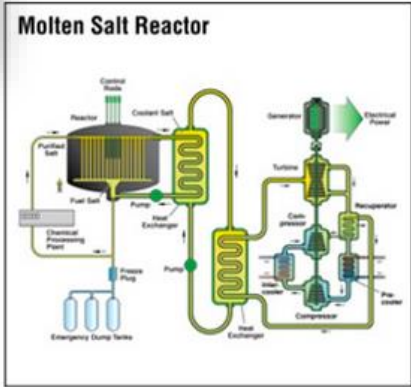
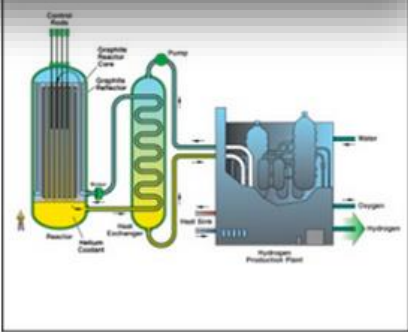
Geothermal is geographically constrained

# Nuclear is the Only Proven Answer

On-demand, carbon-free, and compact



# New Nuclear Designs Address Traditional Problems



# Positive Environmentalism

*Is geo-engineering the future?*

