



# The Green Entrepreneurial State

## from fixing markets to co-creating and shaping

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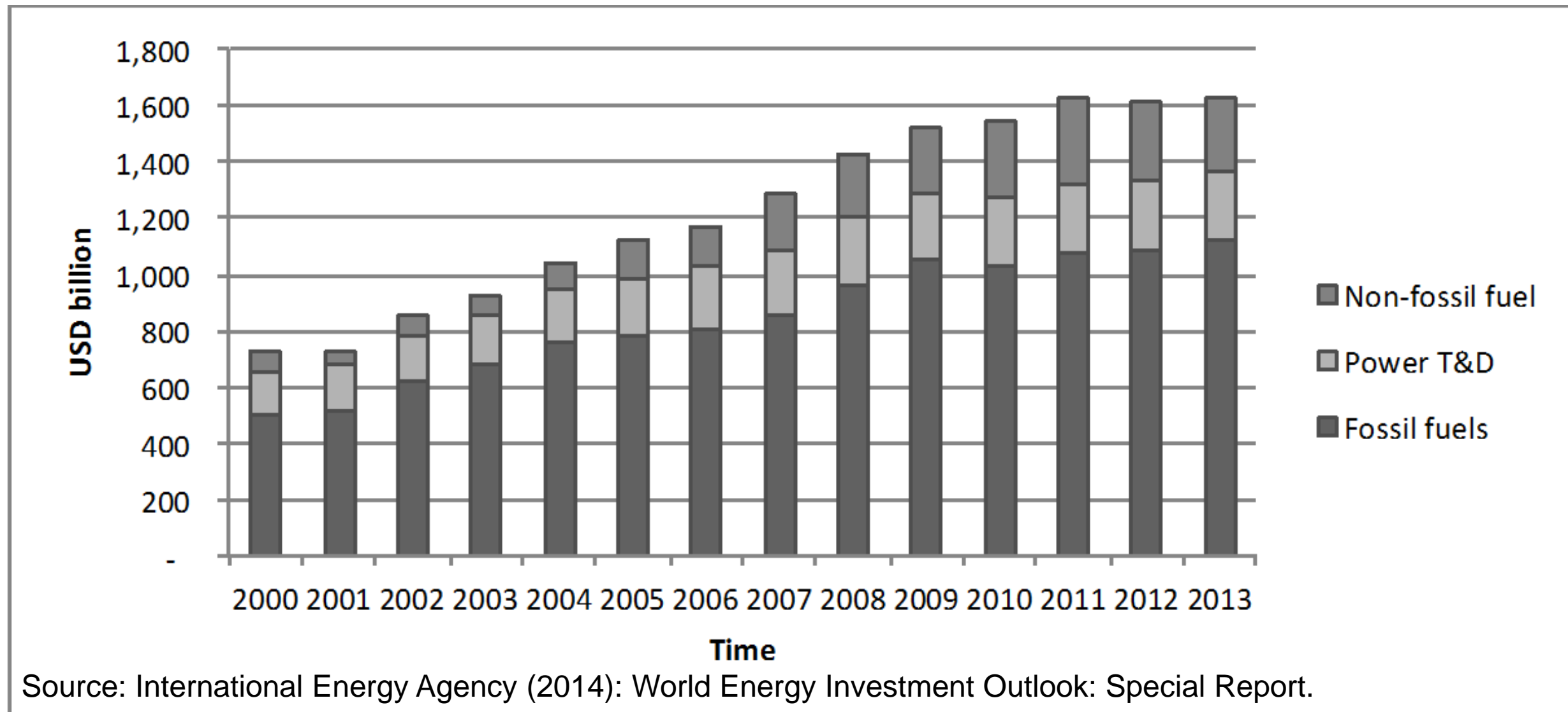
[www.marianamazucato.com](http://www.marianamazucato.com) @MazzucatoM

International Energy Agency estimates that an additional USD 1.1 trillion in low-carbon investments is needed every year on average until 2050, in the energy sector alone, to keep global temperature rise below 2 degrees Celsius.

This implies current investment in GREEN ENERGY is only 20% of what it should be!

- Breakthrough Energy Coalition
- Mission Innovation & Clean Energy Ministerial

# Global energy finance



Biggest challenge: *what is State's role?*

Set 'level' playing field then *get out of the way*

De-risk (and 'facilitate') private sector

Solve market and system 'failures'

Something ... more interesting?

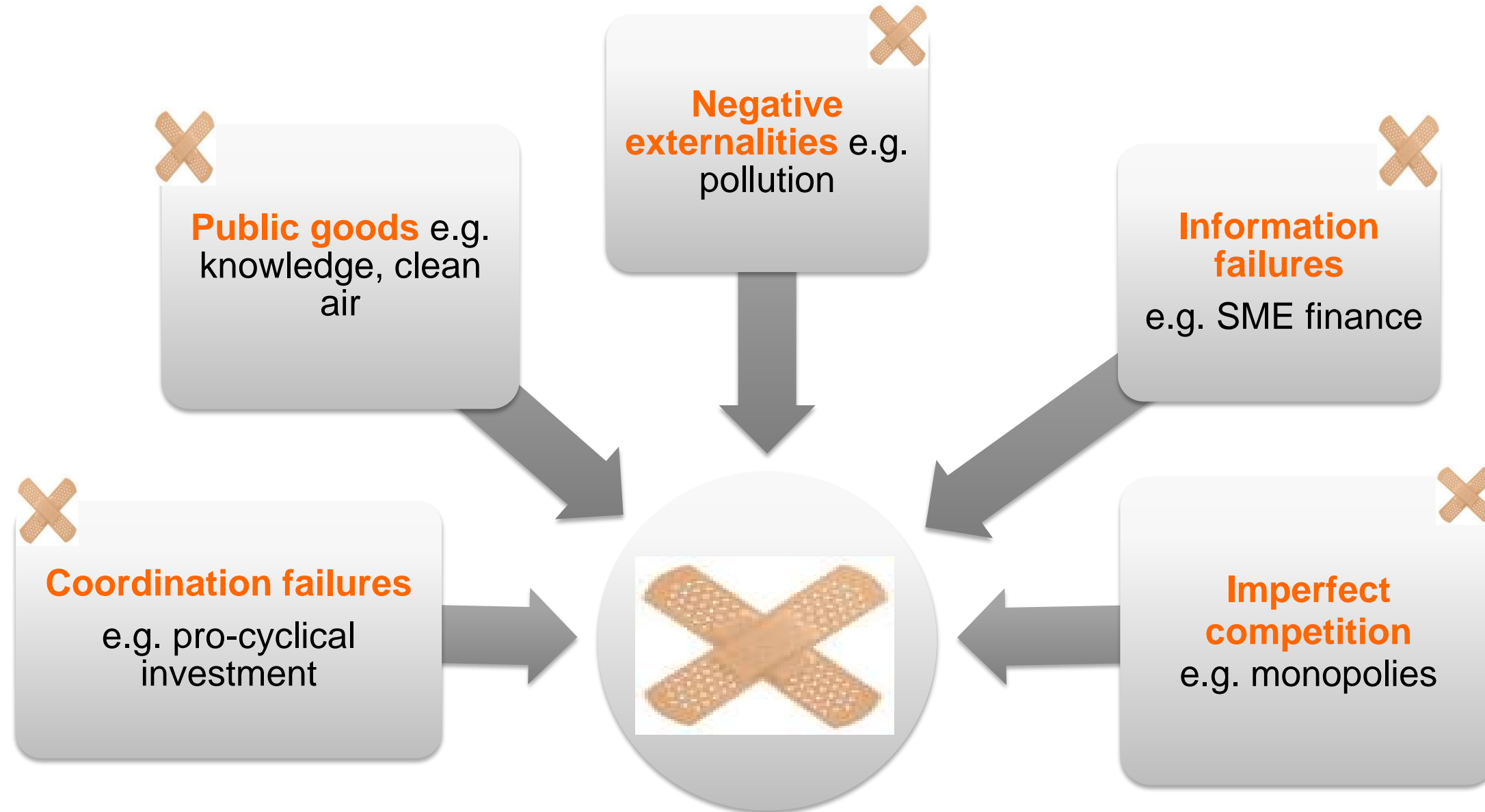
# Narrow view



**"Governments** have always been lousy at picking winners... As the revolution rages, **governments should stick to the basics:** better schools for a skilled workforce, clear rules and a level playing field for enterprises of all kinds... **Leave the rest to the revolutionaries.**"

(‘The Third Industrial Revolution’, *The Economist*, April 21, 2012).

# Only fixing market failures?



# the assumption

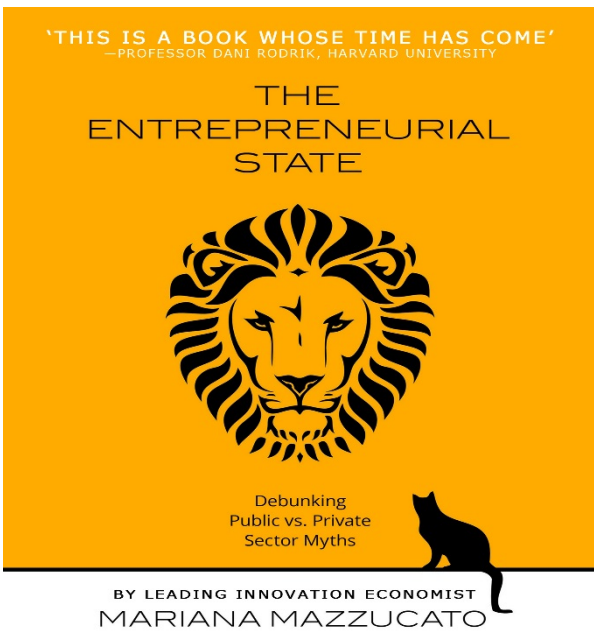


private sector

vs.



public sector



## Shaping and Co-Creating Markets

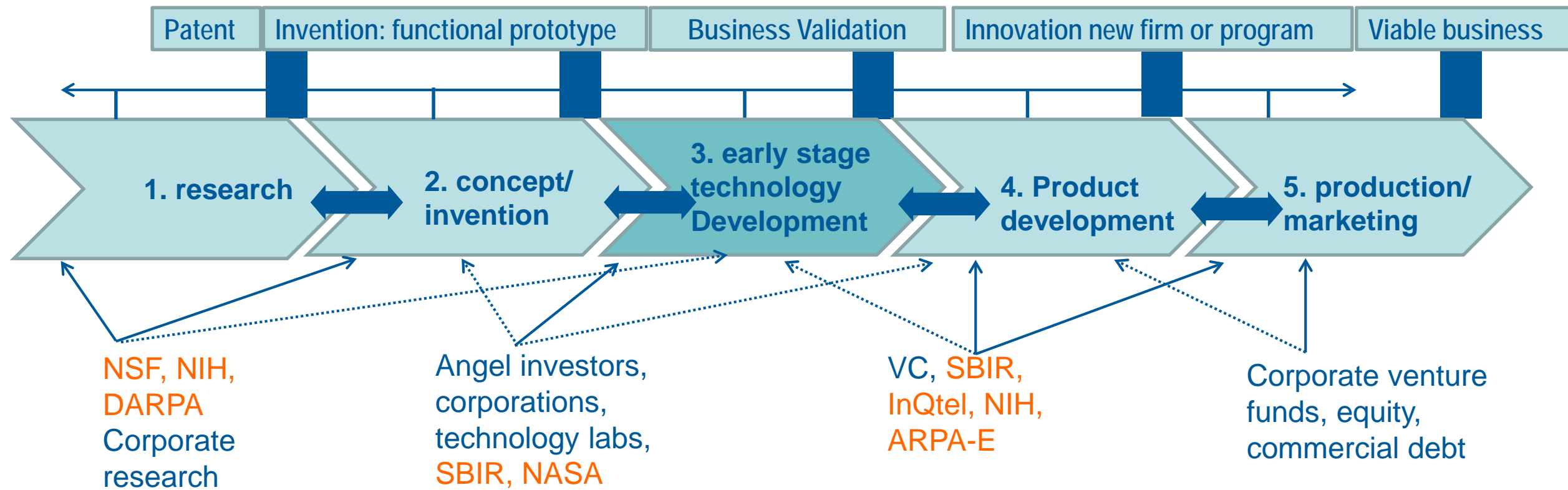




# Market failure policies don't explain *General Purpose Technologies*

- 'mass production' system
- aviation technologies
- space technologies
- IT
- internet
- nuclear power
- nanotechnology
- green technology

# Missions and risk-taking along entire innovation chain



Source frequently funds this technological stage

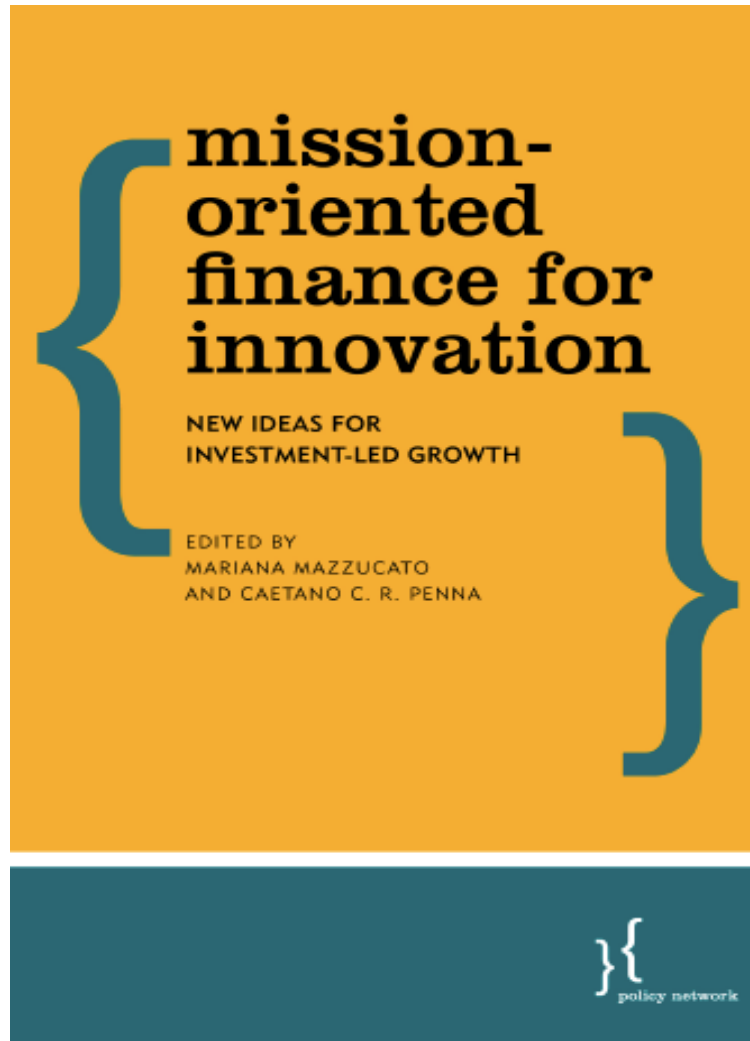


Source occasionally funds this technological stage

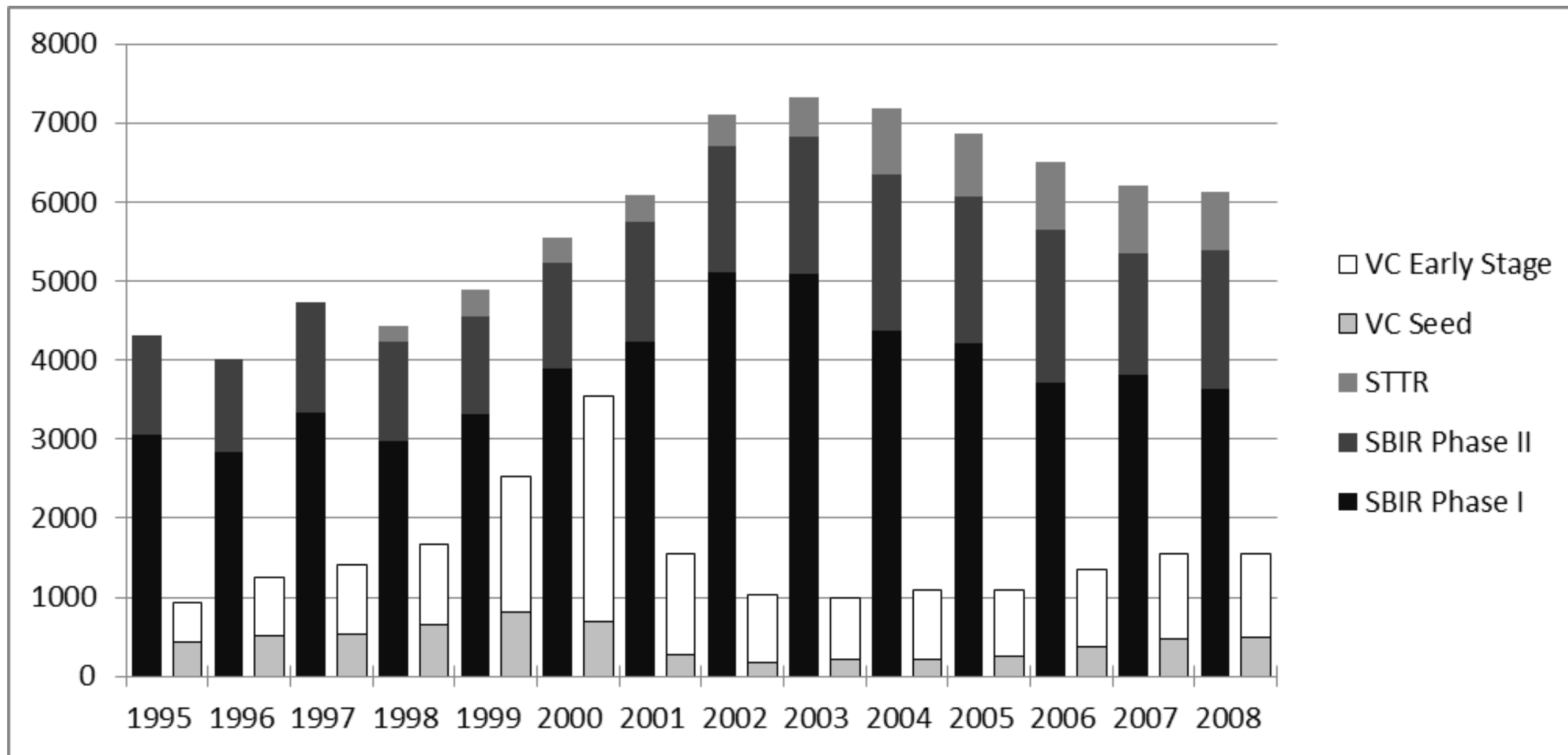
source: adapted from Auerswald/Branscomb , 2003

*We measure success by how many risks we have been willing to take (with inevitable failures) and whether the successes actually matter.*

**Cheryl Martin**, ex-Director ARPA-E

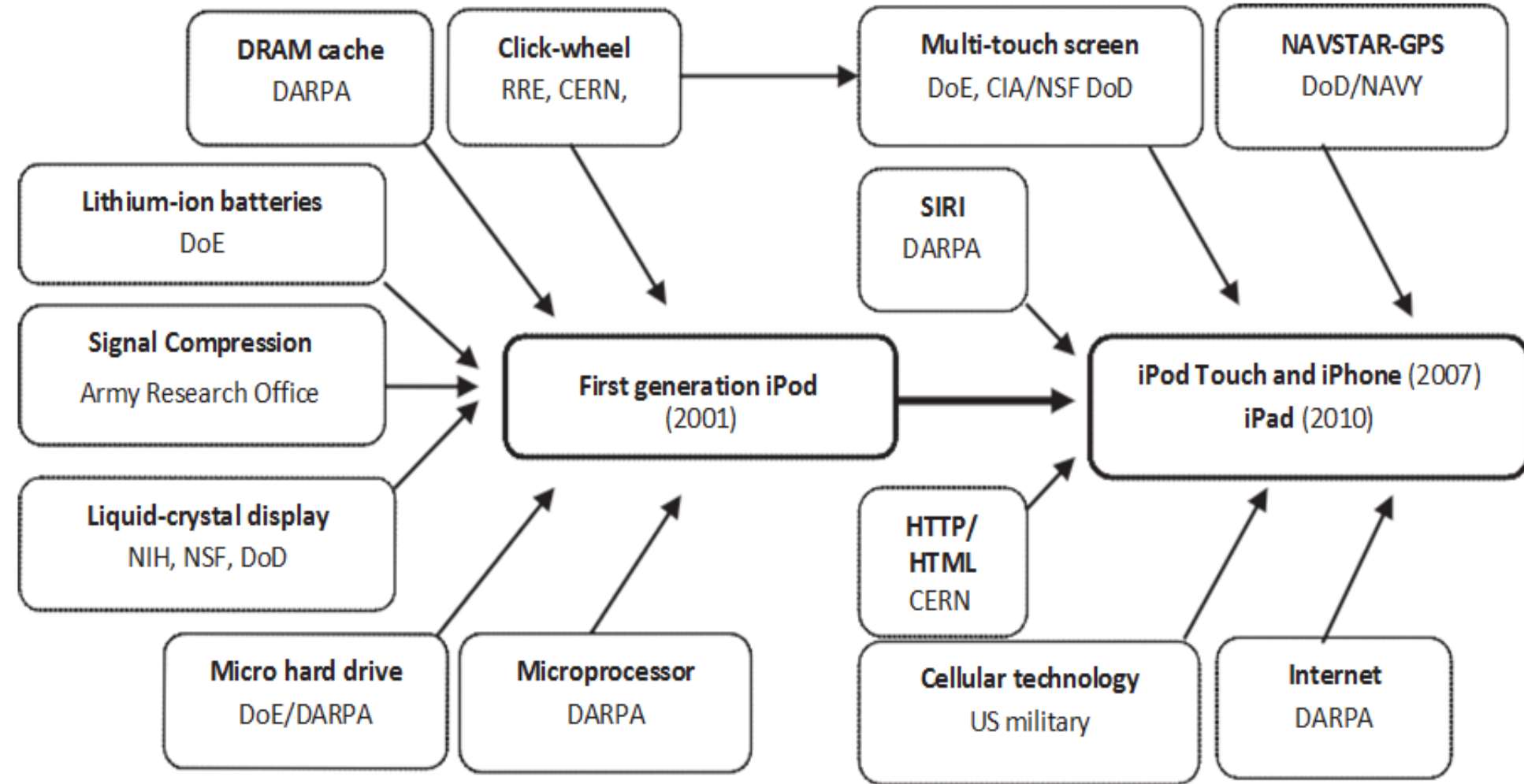


# Private and Public (SBIR) Venture Capital

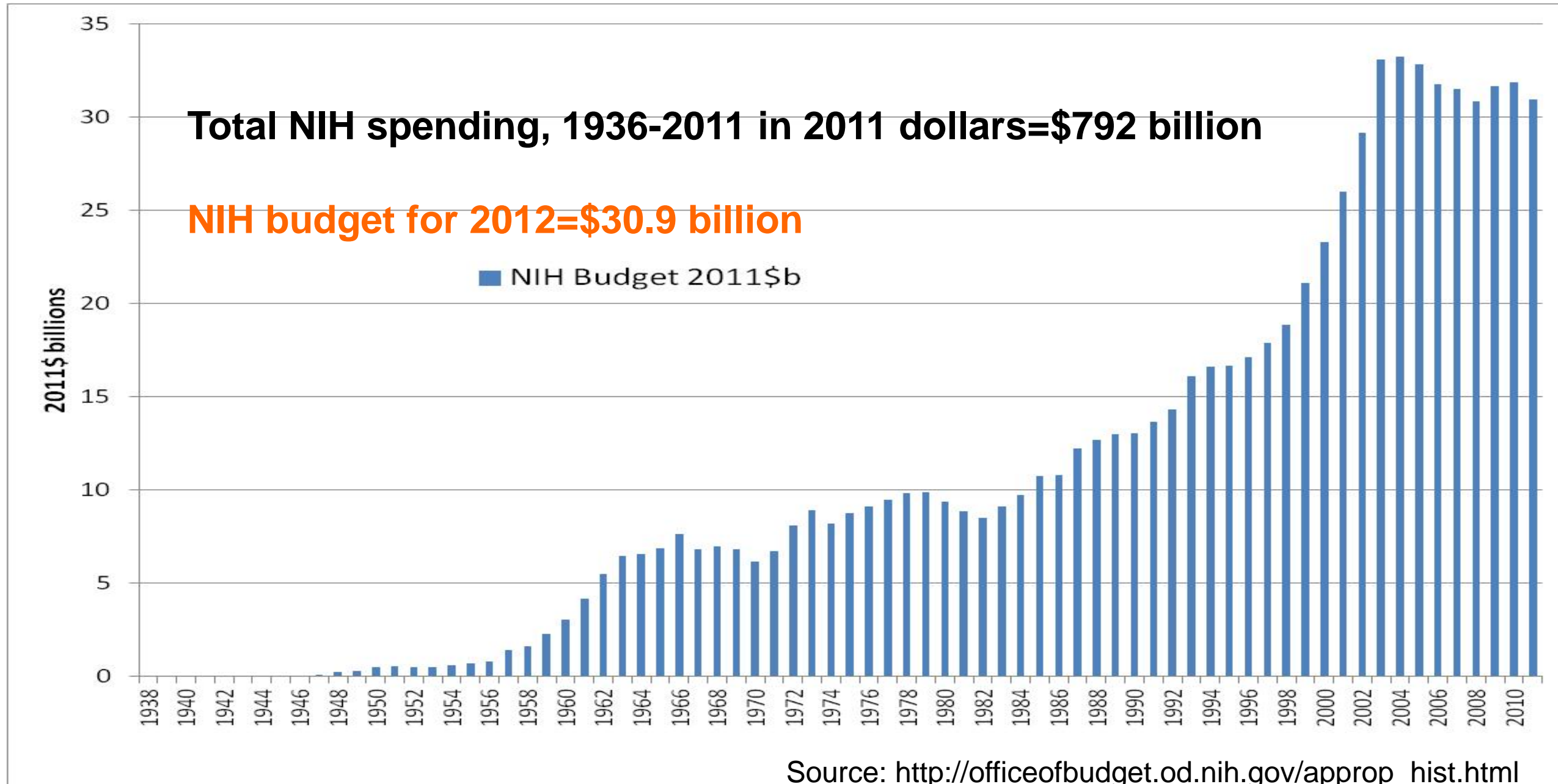


Source: Block and Keller, 2012

# What makes the iPhone so 'smart'?



# National Institutes of Health budgets 1936-2011



# Creating missions not fixing markets

**NASA's mission** is to “*Drive advances in science, technology, aeronautics, and space exploration to enhance knowledge, education, innovation, economic vitality, and stewardship of Earth.*” NASA 2014 Strategic Plan

“*Creating* breakthrough technologies for national security is the **mission** of the Defense Advanced Research Projects Agency (**DARPA**).”

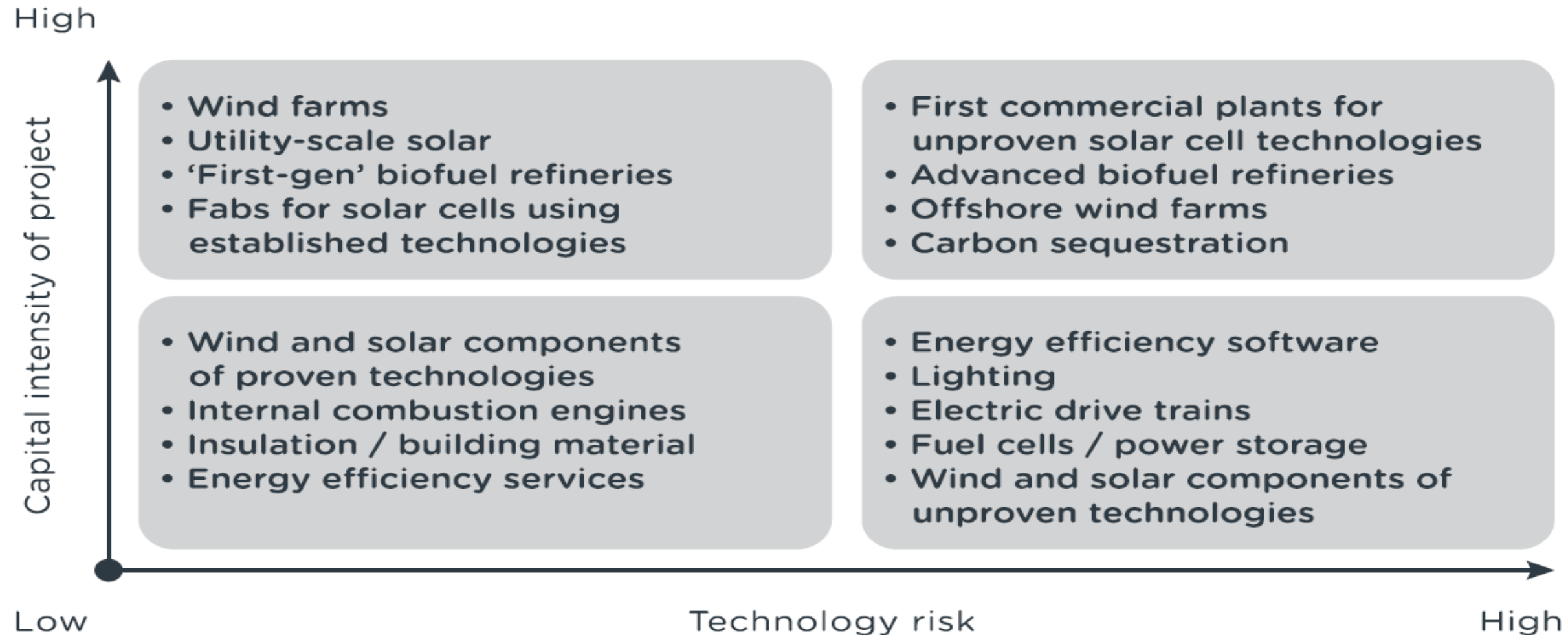
“The **ARPA-E mission** is to *catalyze* the development of transformational, high-impact energy technologies.”

“**NIH's mission** is to seek fundamental knowledge about the nature and behavior of living systems and the *application* of that knowledge to enhance health, lengthen life, and reduce illness and disability.”

“The **mission** of the **KfW Group** is to support change and encourage *forward-looking ideas* – in Germany, Europe and throughout the world.”

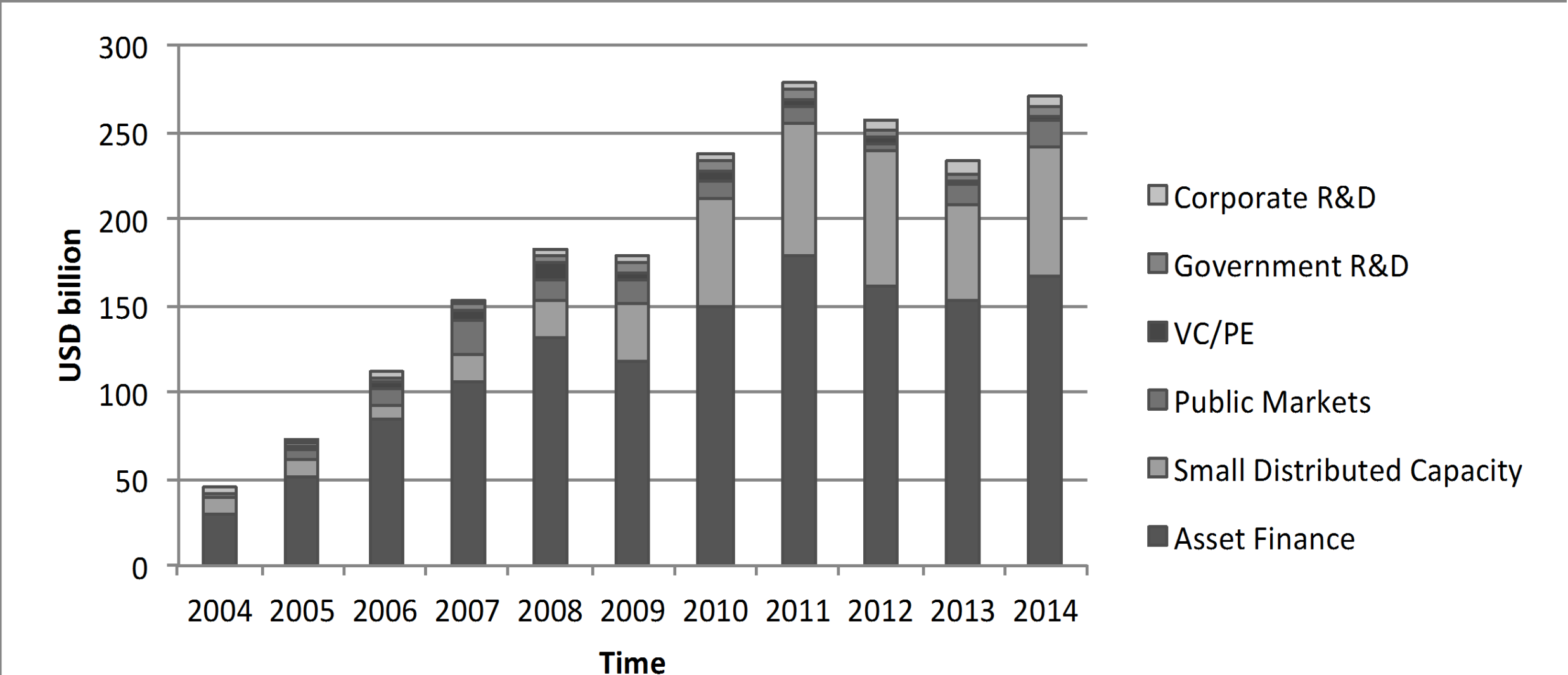
# Technology risk in clean tech

*(venture capital will ride the wave, who will kick/push?)*



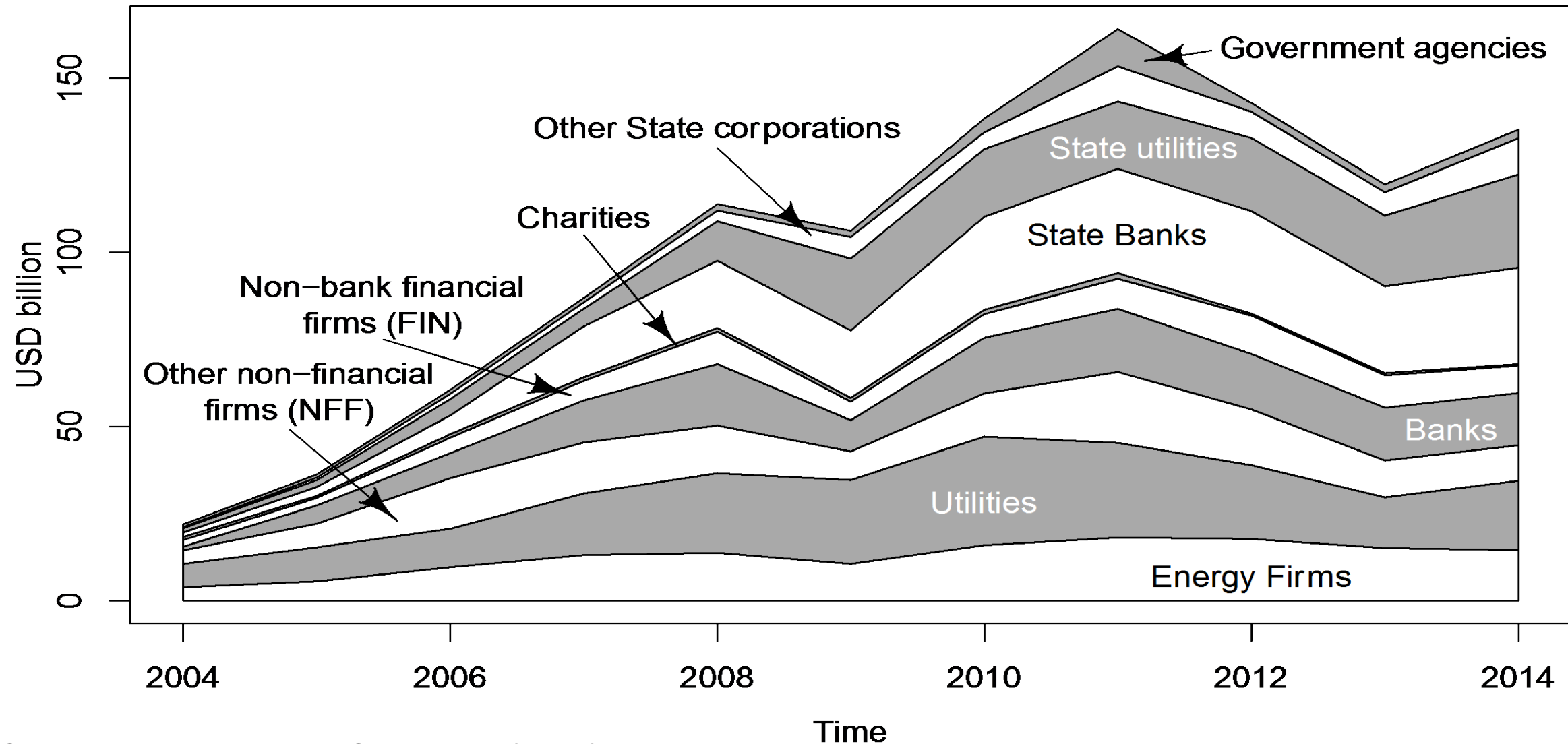


# Global *renewable energy* (RE) finance



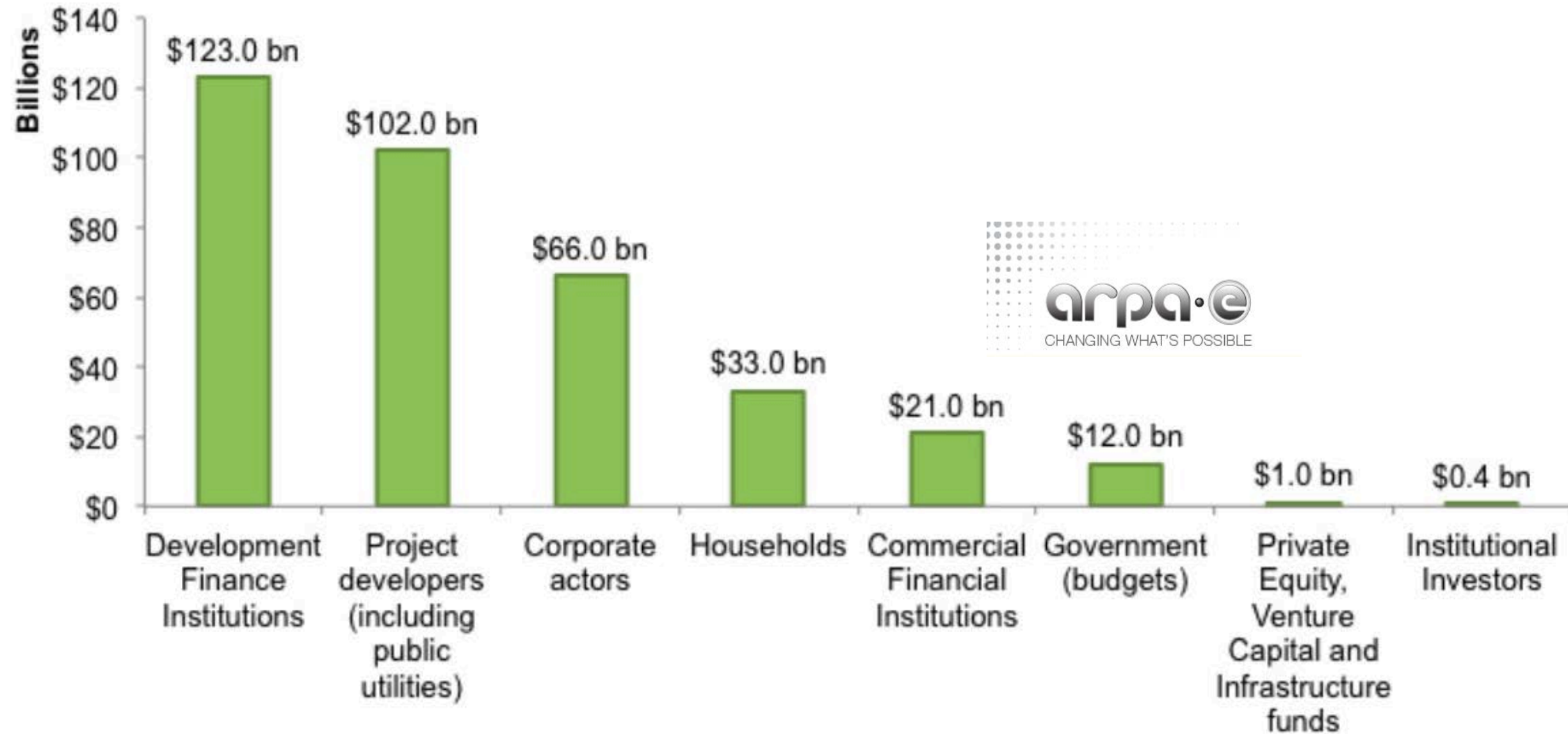
Source: UNEP & Frankfurt School (2015): Global Trends in Renewable Energy Investment 2015.

# Heterogeneous actors in RE



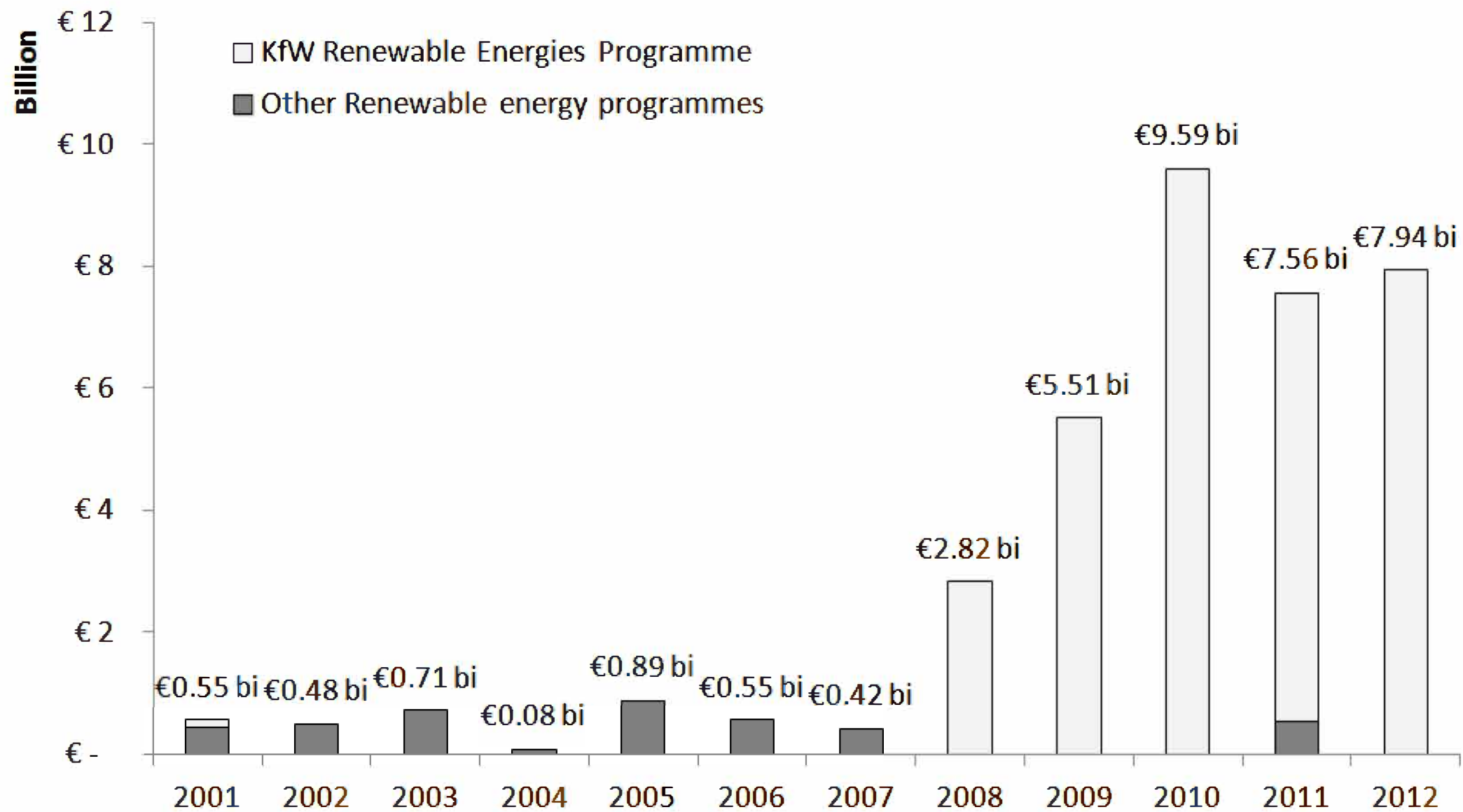
Source: Mazzucato and Semieniuk (2016), based on data by Bloomberg New Energy Finance.

# Green tech public & private investments (2011)

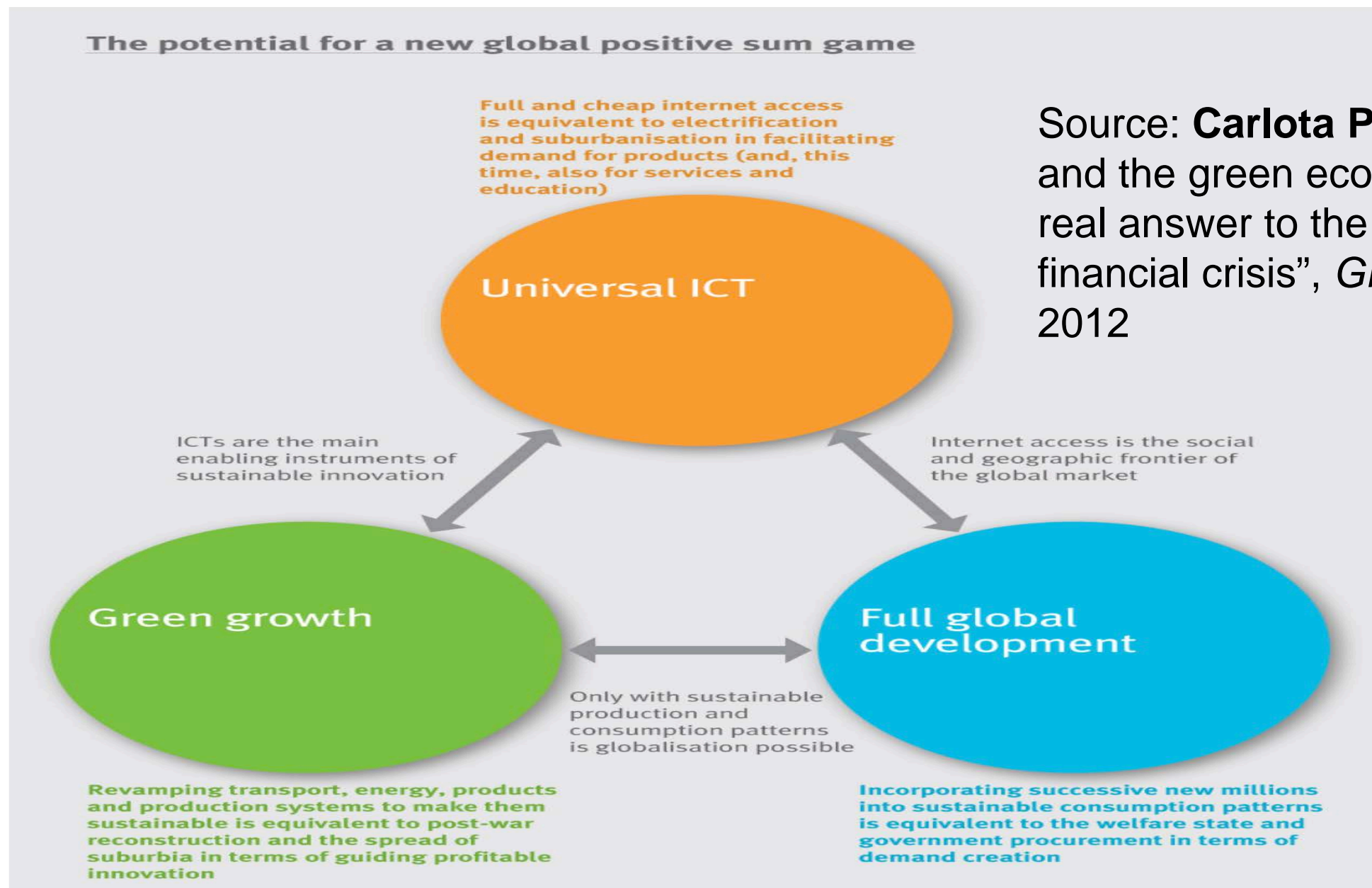


Source: Climate Finance Initiative

# KfW funding for industrial environmental and climate protection projects in Germany 2001-2012



# Tilting the playing field via Demand



Source: **Carlota Perez**, "Why IT and the green economy are the real answer to the financial crisis", *Green Alliance* 2012



A key element to get **an energy breakthrough** is more basic research. And that **requires the government to take the lead**. Only when that research is pointing towards a product then we can expect the private sector to kick in.

Source:

<http://www.youtube.com/watch?v=x54bVu>

duggU

## THE TOP 10 STOCK REPURCHASERS

2003-2012

At most of the leading U.S. companies below, distributions to shareholders were well in excess of net income. These distributions came at great cost to innovation, employment, and—in cases such as oil refining and pharmaceuticals—customers who had to pay higher prices for products.

### The elephant in the room: Financialisation

Fortune 500 companies have spent **\$2.3 trillion** on **buybacks** from **2003-2012** (54% of their earnings), with another 37% on dividends.

(William Lazonick, HBR 2014)

#1 EXXON MOBIL	#2 MICROSOFT	#3 IBM	#4 CISCO SYSTEMS	#5 PROCTER & GAMBLE
NET INCOME \$347B	NET INCOME \$148B	NET INCOME \$117B	NET INCOME \$64B	NET INCOME \$93B
REPURCHASES \$207B	REPURCHASES \$114B	REPURCHASES \$107B	REPURCHASES \$75B	REPURCHASES \$66B
DIVIDENDS \$80B	DIVIDENDS \$71B	DIVIDENDS \$23B	DIVIDENDS \$2B	DIVIDENDS \$42B
TOTAL \$287B 83% of NI	TOTAL \$185B 125% of NI	TOTAL \$130B 111% of NI	TOTAL \$77B 121% of NI	TOTAL \$108B 116% of NI
CEO PAY \$289M	CEO PAY \$12M	CEO PAY \$247M	CEO PAY \$297M	CEO PAY \$90M
% STOCK BASED 73%	% STOCK BASED 0%	% STOCK BASED 64%	% STOCK BASED 92%	% STOCK BASED 16%
\$211M	\$0*	\$158M	\$273M	\$14M
#6 HEWLETT-PACKARD	#7 WALMART	#8 INTEL	#9 PFIZER	#10 GENERAL ELECTRIC
NET INCOME \$41B	NET INCOME \$134B	NET INCOME \$79B	NET INCOME \$84B	NET INCOME \$165B
REPURCHASES \$64B	REPURCHASES \$62B	REPURCHASES \$60B	REPURCHASES \$59B	REPURCHASES \$45B
DIVIDENDS \$9B	DIVIDENDS \$35B	DIVIDENDS \$27B	DIVIDENDS \$63B	DIVIDENDS \$87B
TOTAL \$73B 177% of NI	TOTAL \$97B 73% of NI	TOTAL \$87B 109% of NI	TOTAL \$122B 146% of NI	TOTAL \$132B 81% of NI
CEO PAY \$210M	CEO PAY \$189M	CEO PAY \$127M	CEO PAY \$91M	CEO PAY \$126M
% STOCK BASED 37%	% STOCK BASED 62%	% STOCK BASED 62%	% STOCK BASED 25%	% STOCK BASED 25%
\$78M	\$117M	\$79M	\$23M	\$32M

# Think Again!



private  
sector

vs.



public  
sector



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