# Technological revolutions: the mutual influence of technology and society

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I have an important message for you:

## THE POSSIBILITY OF A SUSTAINABLE GLOBAL GOLDEN AGE LIES AHEAD

- We can rescue the good life that the welfare state promised in the advanced world
- Make it reach the majorities in the world population
- And save the planet for us and for future generations

#### THIS CAN BE SAID, BY LEARNING FROM THE HISTORY OF TECHNOLOGICAL REVOLUTIONS

## **FIVE TECHNOLOGICAL REVOLUTIONS IN 240 YEARS**

1771	The 'Industrial Revolution' (machines, factories and canals)	
1829	Age of Steam, Coal, Iron and Railways	
1875	Age of Steel and Heavy Engineering (electrical, chemical, civil, naval)	
1908	Age of the Automobile, Oil, Petrochemicals and Mass Production	
1971	Age of Information Technology and Telecommunications	
20??	Age of Biotech, Nanotech, Bioelectronics and new materials?	

## EACH ONE LEADS TO A TECHNO-ECONOMIC PARADIGM SHIFT

that changes the direction of innovation in the economy and society

A new way of LIVING

A new way of PRODUCING

EACH PARADIGM brings a far reaching transformation

A new way of CONSUMING

A new way of WORKING

Because of resistance to such major paradigm shifts

## CAPITALISM EXPERIENCES PENDULAR SWINGS EVERY TWO OR THREE DECADES

From a period of FINANCIAL CAPITALISM to force the INSTALLATION of each technological revolution with unfettered free markets and income polarization

To a period of PRODUCTION CAPITALISM aided by government to enable the full DEPLOYMENT of the new potential across the economy and spread its benefits to society

#### A MAJOR BUBBLE COLLAPSE SIGNALS THE NEED TO SWING THE PENDULUM

It is time for government and civil society to unleash the Golden Age

## THE HISTORICAL RECORD: Bubble prosperities, recessions and golden ages

		INSTALLATION PERIOD	Bubble co recess		DEPLOYM	ENT PERIOD	
No., date, revolution, core country		Bubble prosperity	TURN POII		olden Age' prosperit	ty Matu	rity
1 <sup>st</sup>	1771 The Industrial Revolution Britain	Canal mania	1793	i–97	Great British leap		
2 <sup>nd</sup>	1829 Age of S <mark>team</mark> and Railways Britain	Railway mania	1848-4	50	The Victorian Boor	m	
3rd	1875 Age of Steel and heavy Engineering Britain / USA Germany	London funded global market infrastructure build-up (Argentina, Australia, USA)	1890-	-95	Belle Époque (Euro 'Progressive Era' (l	• •	
4 <sup>th</sup>	1908 Age of Oil, Autos and Mass Production / USA	The roaring twenties Autos, housing, radio, aviation, electricity	Euro 1929 US 1929	)33 SA	Post-war Golden age		
5 <sup>th</sup>	1971 The ICT Revolution USA	Internet mania, Telecoms, emerging markets Global financial casino & housing	8 8	2008- 20??	Global sustainal knowledge socie	ble ety 'golden age'?	
			We	are he	re		

And the two prosperities are fundamentally different, in nature and social consequences

#### STYLIZED DESCRIPTION OF THE TWO FORMS OF GROWTH

#### INSTALLATION

#### DEPLOYMENT

Production structure	Creative destruction turbulent decline and rise	es
Investment	Concentrated in new technologies and finance	e. Shift v lifestyl
Employment	Declining with modernization and geographical shifts	collapse. Shift and new lifestyles
Government	Impotent, stays out (or is pushed out)	st bubble oduction
Finance	Self-serving casino behaviour	Recession post bubble from finance to production a
Innovation	New products, services, processes and infrastructure	
Direction of shaping	Technology shapes society	Ţ

Creative construction growing synergies

Widely spread across the real economy

Reviving with new fabric of the economy (depending on policy)

Active, shaping markets and guiding innovation

Profitable services to the new real economy

Institutional and social innovations helping transform production

Society shapes technology

And people recognize when the times change from one mode to the other

#### ONE OF THE SIGNS IS THE SPREAD OF THE NEW 'GOOD LIFE'

With a new inter-related set of life-shaping goods and services at 'affordable' prices

From the 1850s: VICTORIAN LIVING The rise of the <u>urban</u> upper and middle classes different from the rural aristocracy

From the 1900: THE BELLE EPOQUE <u>Cosmopolitan</u> lifestyles for middle classes and skilled workers

After WWII: THE AMERICAN WAY OF LIFE <u>Suburban</u> lifestyles, reaching all workers in the advanced countries and middle classes in LDCs

From now on: MANY SUSTAINABLE LIFESTYLES?

<u>Global diversity</u>, using ICT in a green direction and gradually lifting all boats???

EACH NEW STYLE PROPAGATES THROUGH CHANGES IN VALUES AND ASPIRATIONS shaping the consumption desires of the majority guiding innovation trajectories and favoring a new pattern of growth

#### **BUT THIS DOESN' T HAPPEN AUTOMATICALLY**

- It will confront strong resistance from the old lifestyle
- It must respond to social movements and aspirations
- It needs to be synergistic, providing increasing new opportunities and advantages
- It has to be recognized as a positive sum-game (both socially desirable and economically profitable)

#### IT WILL REQUIRE BOLD AND MASSIVE INSTITUTIONAL AND SOCIAL INNOVATION

### How was the Post-War Golden Age unleashed?

### INNOVATION ENABLERS

Cheap oil and materials Universal electricity Road and airway network

Suburbanization Post-war reconstruction Cold war Welfare State Labor unions Public procurement Credit system

#### DIRECTION FOR INNOVATION

DEMAND VOLUME

The same basic framework with a wide range of variation between countries plus the new Bretton Woods institutions at the international level

IT WAS A POSITIVE-SUM GAME BETWEEN BUSINESS AND SOCIETY THAT PRODUCED THE GREATEST BOOM IN HISTORY

Can the ICT paradigm do for the global population what the mass production paradigm did for the great majorities of the 'First World'?

## THE CURRENT OPPORTUNITY SPACE FOR A GLOBAL POSITIVE-SUM GAME

Cheap universal ICT Full internet access at low cost is equivalent to electrification and suburbanization in facilitating demand (and multiplying education)

'GREEN GROWTH' FULL GLOBAL DEVELOPMENT

Revamping transport, energy, products and production systems to make them sustainable is equivalent to post-war reconstruction and suburbanization

Incorporating successive new millions into sustainable consumption patterns with environmentally friendly infrastructures is equivalent to the Welfare State and government procurement in terms of demand creation

# THE NEW TECHNOLOGIES AND THEIR PARADIGM ONLY DEFINE THE SPACE OF THE POSSIBLE

#### A Golden Age is one viable option for Deployment

with 'green growth' bringing worldwide social and environmental sustainability

#### A 'gilded age' is another equally viable option

with financial markets and the military shaping the playing field for a very turbulent world

SOCIETY WILL BUILD THE FUTURE

(globally, nationally and locally)

SELECTING A DIRECTION WITHIN THAT WIDE SPACE OF THE VIABLE

It is the task of this generation to be bold, to choose well and act upon it!

#### PREDICTIONS OF THE FUTURE — EVEN WHEN RIGHT— MAY SOUND UTOPIAN

Imagine someone saying in the mid-1930s depression:

Blue collar workers will have lifetime jobs and fully equipped suburban houses with a car at the door

Most colonies will gain independence

...or saying in the late 1960s:

Some of the values of the hippie movement [back to natural materials, organic food, etc.] will become the luxury norms And that's what happened!

Increasing wages and access to credit made them the best mass consumers

The rising middle classes in LDCs adopted the 'American Way of Life'

Innovation in natural textile fibers transformed the world of fashion

Innovation in distribution logistics made organic foods the premium segment

#### WITH PARADIGM SHIFT PREDICTIONS, IT IS <u>SAFER</u> TO BE BOLD THAN TIMID!

# **THANK YOU!**

To find out more about this way of understanding the current situation with a historical lens, go to:

www.carlotaperez.org