

CAPITALISM, TECHNOLOGY AND A GREEN GLOBAL GOLDEN AGE:

The Role of History in Helping the State to Shape the Future

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Workshop on green transition, Lund, March 2017

Are environmental policies an obstacle to growth?

Is growth an obstacle to environmental sustainability?

With a historical understanding of innovation
the answer to both is NO

Based on the history of technological revolutions
we can argue that:

**Environmental problems can be turned
into solutions for growth and well being**

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, Plastics and Mass Production
- 1971 Age of Information Technology and Telecommunications

**EACH BRINGS A TECHNO-ECONOMIC AND SOCIO-INSTITUTIONAL SHIFT
with new directions for innovation and a potential leap in productivity**

DOUBLE NATURE OF EACH TECHNOLOGICAL REVOLUTION

Radical new technologies

A powerful cluster of new and dynamic technologies, products, industries and infrastructures

New techno-economic paradigm

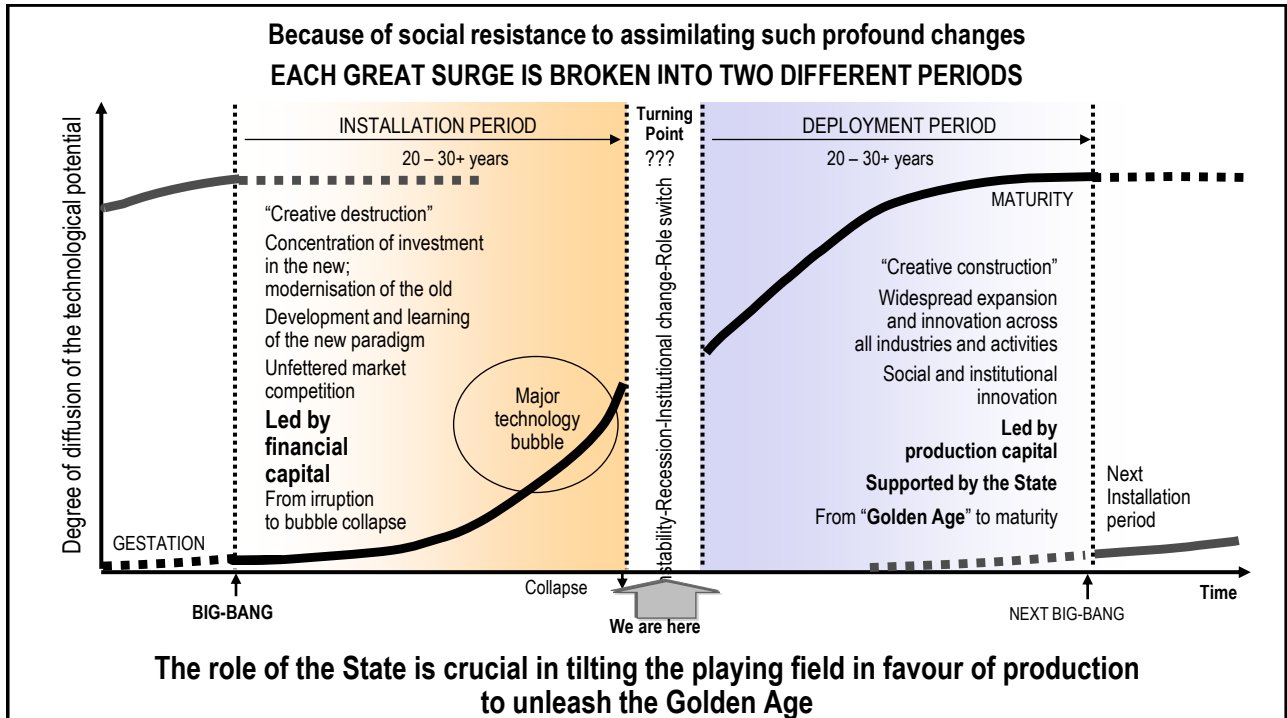
An interrelated set of generic technologies and organisational principles capable of upgrading mature industries and enabling widespread innovation

Explosive growth and structural change (new engines of growth)

A quantum jump in attainable productivity and quality across all sectors

AN ENORMOUS NEW POTENTIAL FOR WEALTH CREATION...

**...gradually transforming the whole economy as well as society and institutions
AND CHANGING THE SPECTRUM OF OPPORTUNITIES FOR ALL**



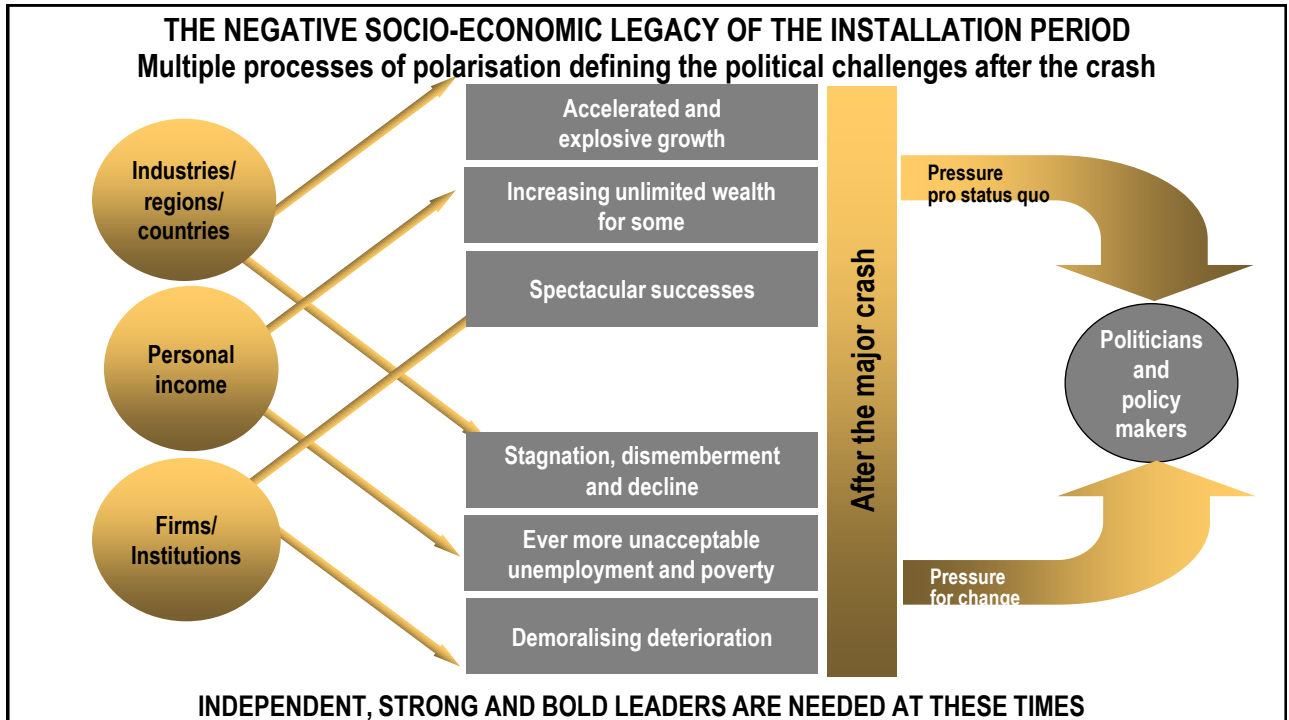
**The positive legacy of the great bubbles
THE INSTALLATION OF THE BASES FOR THE FUTURE**

- Enough infrastructure for a decade or more
- The new paradigm accepted as 'common sense'
- New production, consumption and business models established
- New entrepreneurial giants: New engines of growth
- Old giants rejuvenated and ready to innovate

THE ECONOMY IS READY FOR FULL EXPANSION

There is a vast potential for innovation in ICT
and across all sectors using ICT and/or the installed paradigm

**But if demand is not guaranteed, neither are profits: Finance will not take the risk
JOBS, GROWTH AND INNOVATION CAN ONLY COME IF THE PLAYING FIELD IS TILTED
And that requires policy innovation to suit the paradigm**



THE HISTORICAL RECORD: FIVE REVOLUTIONS WITH A REGULAR PATTERN

Two different 'prosperities' with a bubble collapse in the middle

No., date, revolution, core country	INSTALLATION PERIOD		Bubble collapse recession	DEPLOYMENT PERIOD	
	Bubble prosperity	TURNING POINT	'Golden Age' prosperity	Maturity	
1 st 1771 The Industrial Revolution Britain	Canal mania	1797-1799	Great British leap		
2 nd 1829 Age of Steam and Railways Britain	Railway mania	1848-50	The Victorian Boom		
3 rd 1875 Age of Steel and Heavy Engineering Britain / USA Germany	London funded global market infrastructure build-up (Argentina, Australia, USA)	1890-95	Belle Époque (Europe) 'Progressive Era' (USA)		
4 th 1908 Age of Oil, Autos and Mass Production / USA	The Roaring Twenties Autos, housing, radio, aviation, electricity	Europe 1929-33 USA 1929-43	Post-war Golden age		
5 th 1971 The ICT Revolution USA	Internet mania, telecoms, emerging markets Global financial casino & housing	2000-03 2008-20??	Global sustainable knowledge society 'golden age'?		

Led by finance with unfettered markets Led by production, guided by the State

We are here

This means that the equivalent historical period for the diffusion of the ICT revolution is the 1930s

WHAT IS THE NATURE OF THE TURNING POINT?

Once the bubble collapses
the underlying state of the economy is revealed

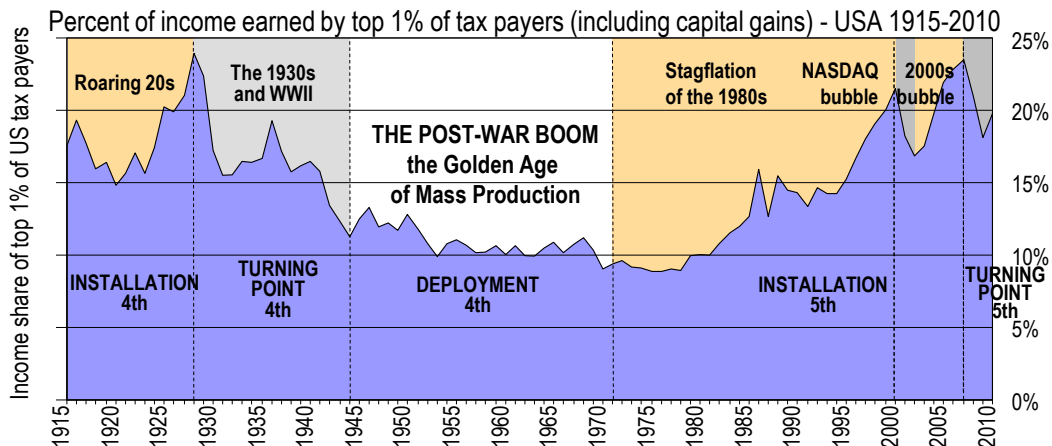
- Finance has become a casino, decoupled from production
- All investment looks uncertain
- No clear market signals
- Deflation, unemployment
- Income is polarised, inequality is stubborn
- Economic migrations
- Talk of secular stagnation and structural unemployment
- Recessions, or feeble growth (even depression)
- Social unrest, xenophobia, messianic leaders

YET THERE IS A HUGE TECHNOLOGICAL POTENTIAL
INSTALLED BY THE BUBBLES

WHAT IT LACKS IS A STABLE SYNERGISTIC DIRECTION

Increasing inequality is one of the features distinguishing installation from deployment

Source: Piketty and Saez 2010 (period indications by CP)



**When positive-sum game policies are applied at the Turning Point
growth resumes, jobs multiply and inequality decreases**

THE RANGE OF THE POLITICALLY VIABLE CAN BE VERY WIDE

In the previous surge we saw
THREE VERY DIFFERENT SOCIO-POLITICAL MODELS
guiding the mass production paradigm

- **National socialism & Fascism**
(from the 1920s and 30s defeated in WWII)
- **“Welfare State” – Keynesianism**
(deployment in the West after WWII)
- **Soviet socialism**
(from Installation in WWI; strengthened after WWII)

And eventually, also, State Developmentalism
in the gradually decolonised “Third World”

ALL WITH A GREAT VARIETY OF NATIONAL VERSIONS
all compatible with the nationally-centred, standardised mass-production
and homogenising mass-consumption paradigm

THE PARADIGM PROVIDES THE POTENTIAL BUT DOES NOT DETERMINE THE OUTCOME

HOW DID ‘WESTERN’ POLICY IN THE POST WAR BOOM OVERCOME THE 1930s?

Apart from the Keynesian management of fiscal and monetary policy

**THERE WAS MASSIVE SHAPING OF DYNAMIC DEMAND
FOR MASS CONSUMPTION AND MASS PRODUCTION:**

- Infrastructure for low-cost suburban housing
- Government guarantees for mortgages
- Unemployment insurance and pensions
- Official labour unions (maintaining salary increases with productivity)
- Free education for the majorities (and in Europe also health)
- Farm subsidies (prices low for consumers and profits high for equipment)
- Military procurement
- Massive government employment
- High taxes to pay for all that
- And the Breton Woods institutions for international finance and trade

**All that provided demand with two clear directions for innovation:
SUBURBAN LIFESTYLES AND THE COLD WAR
with an adequate and effective role for the state**

The best precondition for successful policy is understanding the context being faced

WHY DID KEYNES WORK THEN?

Relatively closed national economies,
with inter-national trade

Mass production was geared to
homogeneous demand

The greater the number of identical products
the lower the cost

Extremely cheap oil and materials
counteracting expensive labour

Stable full-time jobs were the norm
(even life-time)

'Third world' virtually excluded
(not significant demand)

WHAT ARE WE FACING NOW?

Globalised economies,
with WTO watching open trade

Flexible production aims at
highly diversified demand

The more specialised the market
the higher the profits

Potentially expensive energy and materials
with differentiated labour costs

Rapid innovation, moving and changing jobs and
much self-employment

Expansion of global economy
seen as most dynamic demand

**WE NEED TO KEEP KEYNES' AIMS, ADD A SCHUMPETERIAN UNDERSTANDING
AND DESIGN A NEW POLICY FRAMEWORK FOR DYNAMIC INNOVATION AND MARKETS**

EACH GOLDEN AGE → A LIFESTYLE CHANGE

- URBAN Victorian living from 1850s in England
- COSMOPOLITAN Belle Époque in Europe from 1890s
- SUBURBAN 'American way of life' from 1950s
- SMART GREEN LIVING now???

**EACH LIFESTYLE CHANGE → NEW OPPORTUNITIES
FOR INNOVATION, INVESTMENT AND JOBS**

The speed of change depends on the policy direction

Which have been the directions before?

- 1st War procurement
- 2nd Urbanisation and 'workshop of the world'
- 3rd Maximum mobility of goods and people
- 4th Suburbanisation plus the Welfare State and the Cold War

WHAT COULD BE THE DIRECTION NOW?

What could the new directions be?

SMART GREEN GROWTH AND FULL GLOBAL DEVELOPMENT

What is 'Green growth'?

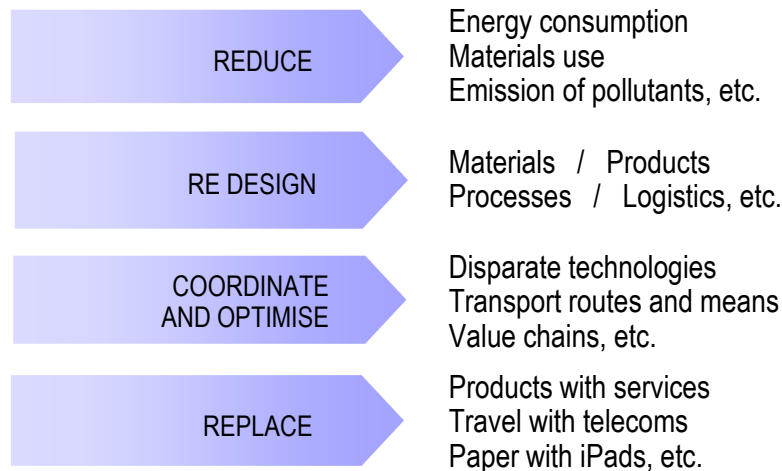
A constant increase in the proportion of intangibles in GDP and lifestyles by multiplying the productivity of resources while improving the quality of life of the great majorities

- Accent on preventive health, exercise, creativity and experiences
- Favouring renewables vs. fossil fuel energy
- Favouring services rather than products
- Drastic reduction of waste, massive increase in reuse and recycling
- Making durable products truly durable and shifting to a rental model
- Seriously reintroducing maintenance (with 3D printing of parts)
- And so on...

AND IT IS SMART

Because it is enabled by the ICT revolution and makes best use of it

THE KNOWN BUT LARGELY UNREALISED POTENTIAL OF "SMART GREEN" FOR PRODUCERS



But the technologically feasible only becomes reality when facing a good opportunity space
SOCIAL VALUES, POLICIES, REGULATIONS, COSTS AND RELATIVE PRICES
 ARE THE ULTIMATE DRIVERS OF THE SHIFT

THE TRANSFORMATION POTENTIAL FOR THE NEW 'SMART GREEN' PRODUCTION AND LIFESTYLES

HUMAN CENTRED SERVICES

Health and care
Leisure and sports
Entertainment and arts
Mobility & Distribution
Diversified electricity
Education 'industry'
Intermediation
Sharing, barter
Collaborative economy
Conservation
Logistics
Maintenance and rental
Resource recovery, recycling, reuse
Pollution reduction
And so on

An aspirational
'good life'
with less energy
and materials,
more ICT and more
jobs

MODERNISATION OF PRODUCTION

Circular economy
Truly durable products
3-D printing
Rental model
Nanotechnology
Renewable energy
Batteries & carbon capture
Sustainable architecture
New construction methods
Bio-plastics & Custom materials
FTTH and Wi-Fi infrastructure
Smart electrical grid
Complex systems engineering
Hydroponics and urban agriculture
and so on

**Massive innovation and massive employment, next to robotics and AI,
in sustainable activities, enhanced and enabled by ICT**

**Why is 'full global development' (beyond Asia)
in the interest of the advanced world?**

BECAUSE IT IS A WIN-WIN GAME
(on top of the humanitarian reasons)

- It would provide demand for advanced country specialisation:
- It would multiply trade flows
(less concentrated in China and Asia)
- It would reduce poverty, violence and, therefore, migrations
- And so on...

IT WILL PROBABLY REQUIRE A MARSHALL PLAN
funded with by taxing global financial transactions

WE NEED TWO SETS OF POLICIES

**CHANGE THE
CONTEXT**

**MODERNISE
GOVERNMENT**

**Stimulating dynamic demand for innovation and investment
And enabling government to handle the new context creatively**

HOW COULD THE PLAYING FIELD BE TILTED NOW?

- Change tax on capital gains to favour long-term investment
- Tilt the playing field in favour of energy and materials saving
- Tax energy, materials and transport (not labour)
- Regulate for durability and maintenance
- Tax products and purchasing, not services and rental
- Facilitate the sharing and collaborative economy
- Set up flexicurity and/or basic income
- Set up a 'new-new deal' about education, skilling and reskilling
- Invest in the new infrastructures (charging for electric cars, smart grids, FTTH, etc.)
- New 'Marshall Plan' for the lagging countries
- Supranational arrangements for global taxes
- And so on...

THE CHANGES NEED TO BE AS BOLD AND IMAGINATIVE AS BRETTON WOODS AND THE WELFARE STATE

SOME ASPECTS OF THE NECESSARY INNOVATIONS TO ADAPT THE INSTITUTIONAL FRAMEWORK

- New arrangements for consensus design of strategy and policy (generalise and adapt European stakeholder capitalism)
- Put the general direction of innovation at the centre of growth policy
- Strengthen capabilities and organisations towards creative, flexible, agile and knowledgeable government
- Maximise devolution to empower local and city governments and encourage local strategies
- Digitise and make simple citizen participation and public services
- Participate in shaping (and accepting) supra-national institutions with enforcing power
- And so on...

AT THE GLOBAL, SUPRANATIONAL, NATIONAL AND, ESPECIALLY, LOCAL LEVELS

**The longer we delay
bringing
the State back proactively,**

**the longer the current socio-economic problems
will affect all countries
but especially the advanced ones...**

...AND ESPECIALLY EUROPE

This presentation was based on my Chapter 11
in the book
RETHINKING CAPITALISM
edited by Michael Jacobs and Mariana Mazzucato

A working paper can be downloaded from

www.beyondthetechrevolution.com/workingpaper/

More of my work on the lessons
from the history of technological revolutions

www.carlotaperez.org