

Janrotmans

Times of Transition: how to accelerate the transition?

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ENERGY TRANSITION

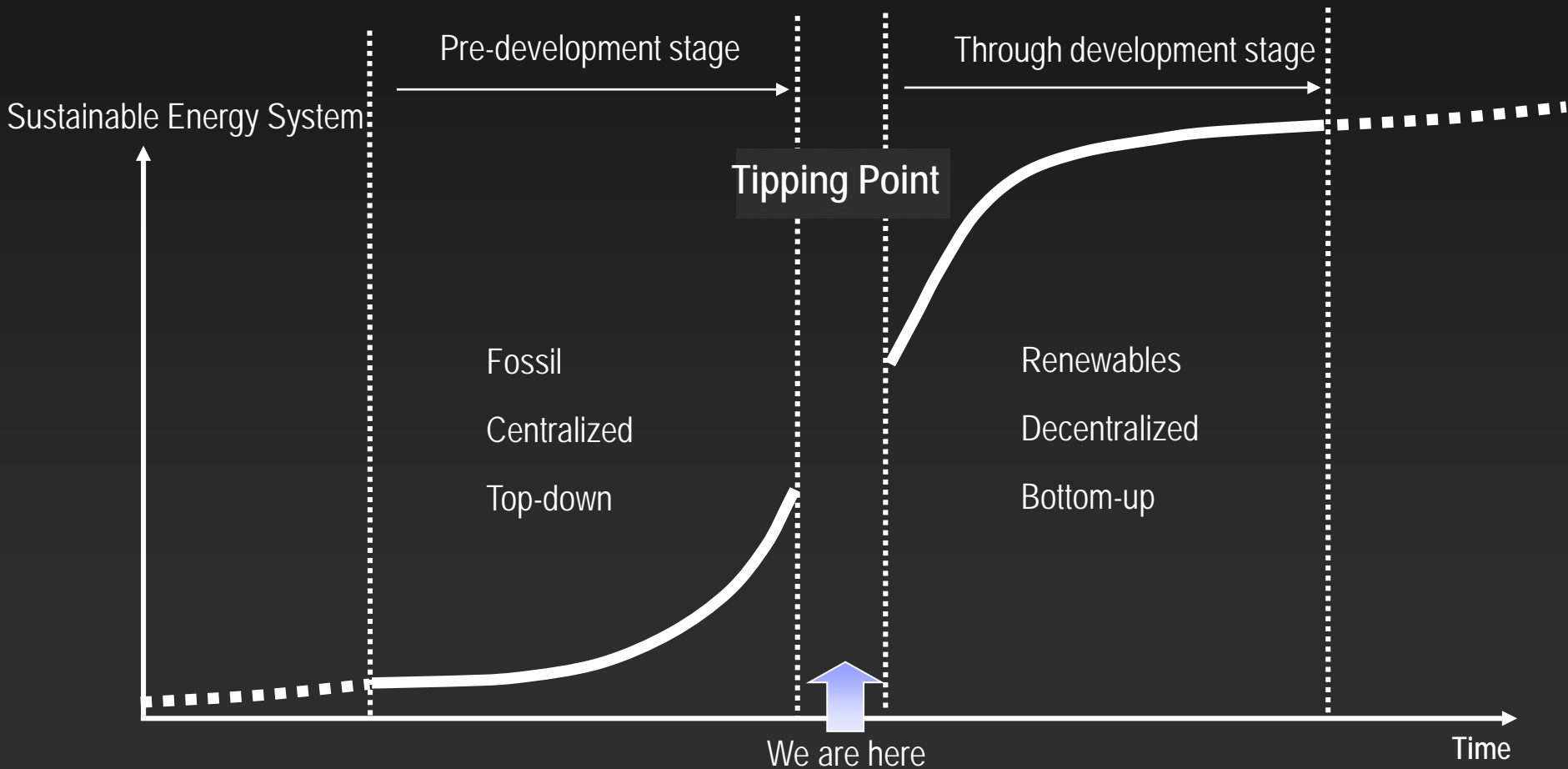
Transition

fundamental change of structure, culture and practices in societal (sub)system

- **structure:** physical infrastructure, economic infrastructure (market, consumption, production), institutions (rules, regulations, actors)
- **culture:** collective set of values, norms, perspectives, paradigms
- **practices:** routines, behaviour, ways of handling, at the individual level

incumbent structure, culture and practices need to be broken down and new ones need to be built up

Transition to Renewable Energy



History Energy Transition

1972	Limits to Growth	Club of Rome
1987	Our Common Future	Brundtland Report
1992	UNCED Conference	Rio de Janeiro
1997	Kyoto Protocol	1 st Climate Accord
2011	Fukushima	Japan
2015	Climate Accord	Paris

Transition = Power Shift

regime: dominant structure, culture and practices with power and vested interests

niche: emerging, divergent structure, culture and practices at a small scale level

niche wants to develop power and take over incumbent regime
regime protects itself against this through absorption, assimilation or elimination of niches

transition = regime-change = power shift

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TIPPING POINT

Tipping Point Phase

chaos

conflicts

battlefield

Tipping Point Indicators

coal fire plants are phased out worldwide

decoupling of economic growth and CO₂-emissions

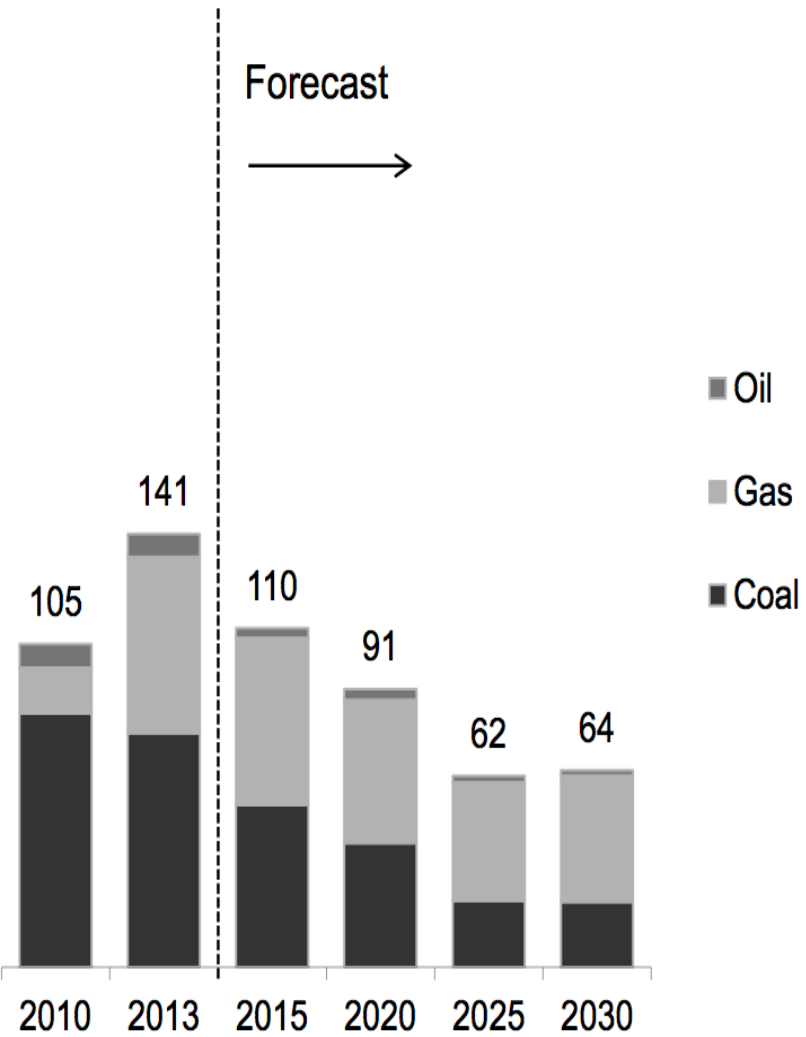
big European energy companies are in trouble

solar PV about 80% cheaper than 7 years ago

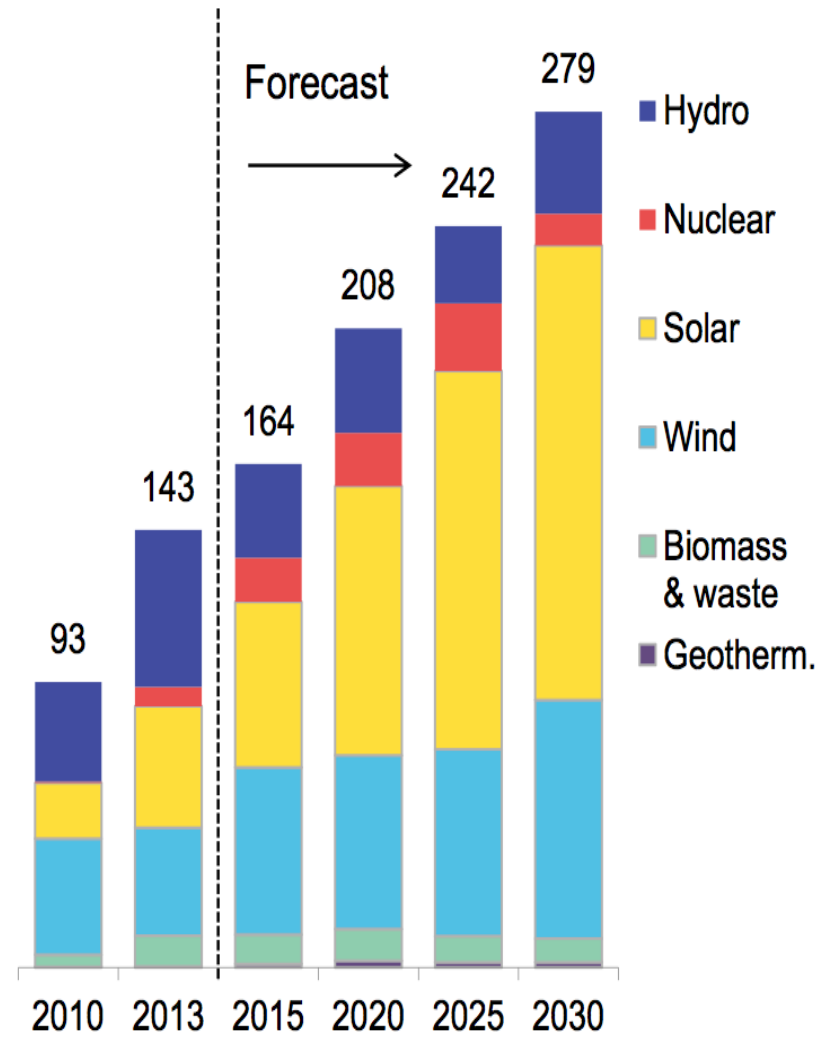
grid parity: solar & wind compete with fossil fuels in many regions

since 2013 more clean energy was installed than fossil fuel

FOSSIL FUEL



CLEAN ENERGY



RWE



Drop in market value since 2008 is 80%

EON



Drop in market value since 2008 is 90%

OIL PRICE



Decrease in Oil price since 2012: 60%

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DETERMINANTS OF THE ENERGY TRANSITION

Forces Impacting Energy Transition

societal pressure

geopolitics

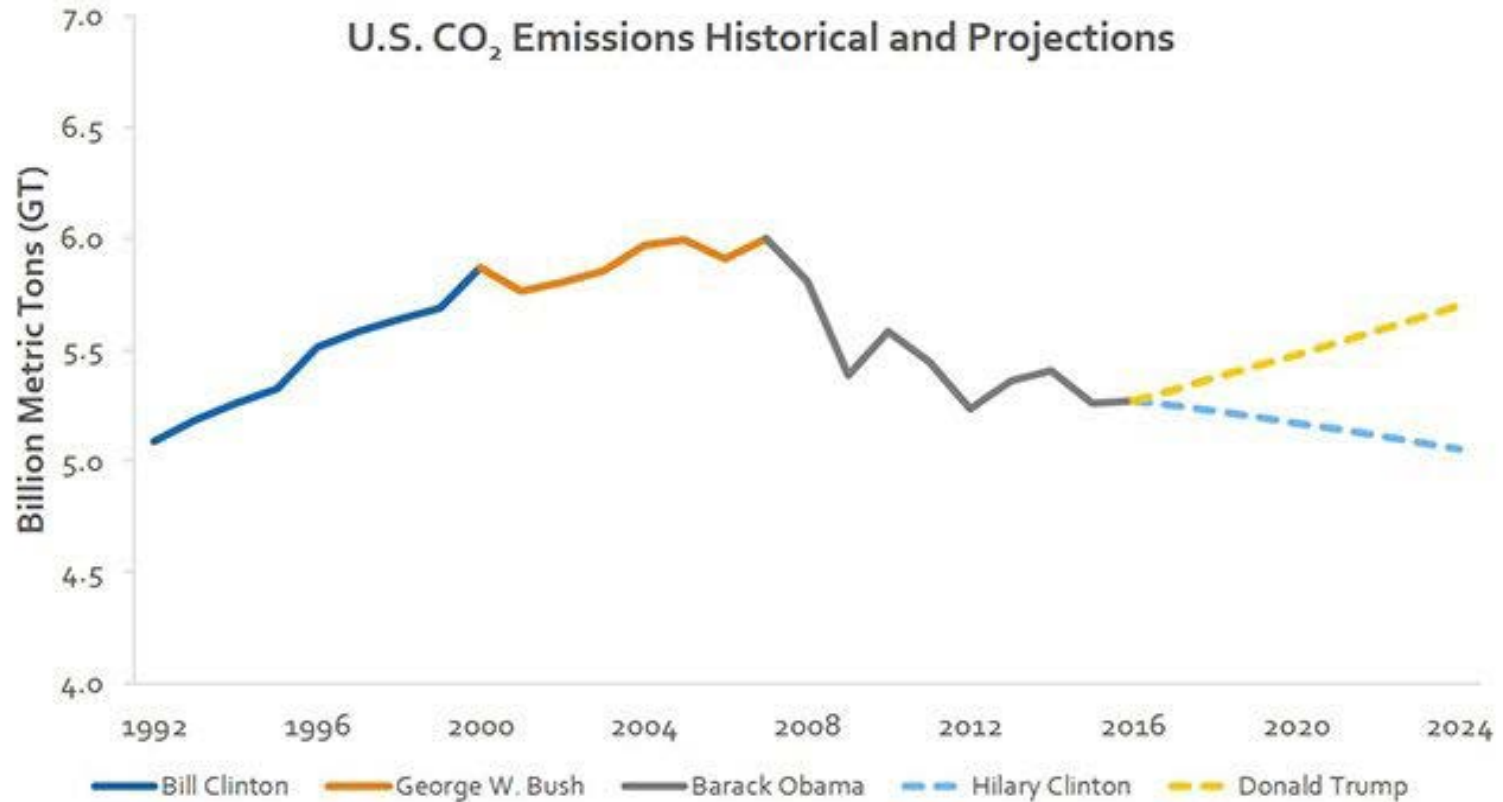
climate

business

finance

Paris Climate Accord: historical landmark

TRUMP-EFFECT



Source: Lux Research, Inc.
www.luxresearchinc.com

Global Divide

Old Economy

fossil fuels

carbon based

linear

centralized

incremental innovation

New Economy

renewables

biomass based

circular

decentralized

radical innovation

Investment in New Economy

every dollar invested in the new economy
yields three dollars added value in terms of:

innovation
employment
economic structure

every dollar invested in the old economy
costs society two dollars

Divestment Movement

began in 2010 by students of Swarthmore College

response to public policy failure

aims to pressure fossil fuel companies

inspired by South Africa divestment campaign

**The global movement to divest from fossil fuels
has doubled in size since 2015.**

\$5 TRILLION

Worth of assets under management have committed to divest

76 COUNTRIES
688 INSTITUTIONS

**transition to new economy
won't be easy and smooth**

Conflicts

Ukraine crisis: Russia versus Europe on gas

China vs Europa conflict on solar panels

America vs China conflict on solar panels

Germany versus other European countries

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HOW TO ACCELERATE THE ENERGY TRANSITION?

Diverse impulses

financial impulses

juridical impulses

institutional impulses

mental impulses

Financial Investment

digital infrastructure	50 billion euros
smart energy infrastructure	20 billion euros
social innovation & education	20 billion euros
5 innovation campuses	10 billion euros
Total	100 billion euros

Investment

software

social innovation 75% of innovation success is social
smarter, flexible, dynamic organising

competence development

co-creation, co-production, connecting
competences for the new economy

Jobs

ca. 125.000 jobs in the short term, till 2025

ca. 250.000 jobs in the long run, till 2050

jobs in digital, clean, circular economy

excl. substitution effect (lost jobs in old economy)

Legal Investment

20 juridical barriers for the new economy

operational, structural and fundamental

structural barrier

residual currents considered as waste in law

Facilitating Government

giving direction & providing space

interconnecting: sectors, scales. people

we need more connectors!

Stimulate New Combinations

3D-Printer

maritime industry

app-development

containertransport

biorefinery

biopolymeren in Haven

maker industry 3.0

Old Harbour Area

elektron. Waste upcycling

Old Harbour Area

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METROPOLITAN REGION ROTTERDAM-THE HAGUE

ROADMAP NEXT ECONOMY MRDH



1. Vision
2. Strategy
3. Action

VISION 2050



zero carbon zero waste circular digital connected

entrepreneurial smart innovative inclusive

TRANSITION PATHWAYS



STRATEGY



integral approach

transition contribution of projects

coherence of projects

phasing in time

various types of projects

[enabling, carrier, icon projects]

START PROJECTS THIS YEAR



1. Truck Platooning → Smart Mobility
2. Waste2Chemicals → Biorefinery
3. Growing as a service → Ditigization of Greenport
4. Geothermal Energy → Smart Energy
5. CO2 Grid → Smart Energy
6. Campuses with field labs → Next Education & Entrepreneurship
7. Next Gen. Residential Areas → smart, energy neutral, circular districts

IN 5 YEARS



100.000 existing houses energy neutral

3 campuses for next economy

6 neighbourhoods smart & energyneutral

Dutch windwheel



Regional Investment Platform



end 2017 initiated Investment Platform

begin with 7 business cases

prelude to plethora of business cases

First in Europe

Great Challenge

we have everything
people, knowledge, technology, institutions
courage & leadership!

**Everybody said it was impossible
until somebody stepped by
who didn't know that**