Good Energies Chair for
Management of Renewable Energies

University of St.Gallen

# How can we breakthrough in the 6th Wave of innovation and turn the 4th Industrial Revolution (FIR) into the era of the energy breakthroughs what will help to stabilize the Earth's climate in few decades?

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*The present research is investigating on the gaps in the energy transition politics and climate change policies with objective to engage into discussion with multiple actors considering the energy breakthroughs as the shortest way to transform the energy system and economy.*

## PROBLEM STATEMENT AND RESEARCH OBJECTIVES

Here are few major problems we must urgently address:

- The energy transition does not unfold fast enough;
- The true technological diversity is not reflected in the decarbonisation strategies;
- The gaps at different levels are delaying the elaboration of the visionary and efficient energy & climate policies.

The objective of this work is to find out what are the missing synergies and how to bring new energy technologies to the market in time, and get closer to the breakthrough trajectory in the 6th wave.

## METHODOLOGY

The present research is the analytical one, investigating four scientific areas in cross-cutting manner at the macro level:

- The 6th wave of innovation mechanics: "creative destruction"
- The role of clean energy in the 4th industrial revolution
- The geo-engineering technics vs. mitigation: new risks
- The true technological diversity and the challenges in science
- Missing synergies for the Advanced Energy Transition and the Breakthrough in the 6th wave.

## CURRENT SITUATION: " BIG DISCONNECT"

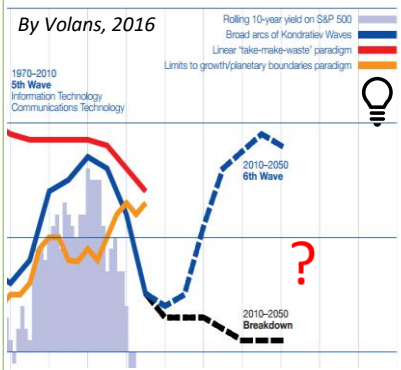
**New development cycle is here**, and the risk of breakdowns is growing with every single day of delay in the transformational actions.

**FIR is shaping the next wave**, but it is not answering how this revolution will be powered. The energy demand is growing too fast adding new pressures.

Most ambitious energy transition strategies are debating **how to fit +2C° scenario** with known renewables, geo-engineering, carbon-capture, keeping in silence transformational potential of the advanced energy technologies.

The **energy RD&D sector is experiencing sever stagnation** explained by the historical investments in status-quo technologies.

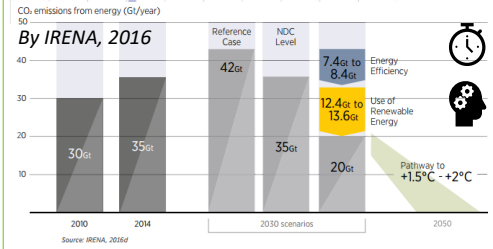
*By Volans, 2016*




**Kondratieff: "Winter Time":**

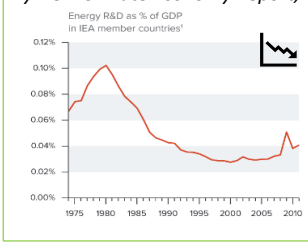
**We are in a zone of highest turbulence and uncertainties and we need an ambitious vision. The "creative destruction" is what can shape this new cycle and if managed cleverly reduce the cost of the transformations.**

*By IRENA, 2016*




**Recent data confirm: NDC's are not reflecting climate urgency and tech. innovation potential.**

*By New Climate Economy Report, 2014*




**The energy RD&D funding is extremely low, and heavily outpaced by leading FIR's industries, which are turning into priorities in terms of investments.**

## KEY FINDINGS

**It is a critical moment to structure the 6th wave of innovation.**

1. The Advanced Energy Transition is targeting technological innovations harvesting clean, fuel-less, abundant, decentralised, efficient and cheap energy to supply the entire civilisation needs.
2. Cold fusion, Electromagnetic over-unity, Water as fuel, Zero-Point Energy, Vortex generators, Cavitation, Magnet Motors, etc., are just few of what we can develop fast enough. So far, we need a debate.
3. Few technologies are now in the market: E-Cat, Minato motors, Brilliant Light Power (suncell) and are totally changing the economics of the energy businesses, offering new vision for the energy future.

**New Energy Paradigm is the synonymy of New Economic Development founded on a higher consciousness of the society. It can turn the 6th wave into the cycle of major breakthroughs and make the 4th industrial revolution meaningful for People and Planet.**

## SYNERGIES REQUIRED IF WE CHOOSE "BREAKTHROUGH"

**Government:**

Efficient policy mix, built on "creative destruction" machanics.

Connection of energy policies with new climate science facts.

RD&D funding continuity : helping technologies to cross the "Valley of Death".

**Science:**

Resorbing conflicts between New and Old beliefs. Collaboration for One goal.

Focus on technologies with potential to efficiently address global problems.

Focus on physics in open systems, offering higher efficiences to technologies (finance, patenting).

**Advanced Energy Transition**

**2020-2050**

**Business:**

From BAU to True sustainability: from concerns to new values and responsible behaviour (circular economy as the foundation).

Involvement in visionary innovation projects, what will reduce many risks related to energy prices fluctutations and offer sounding opportunities .

**Civil Society:**

Raising awarness on new energy technologies, enabling young gen. to act. Co-creating new tech.

Reaching higher consiousness to develop new culture of responsible consumption to overcome "technological duality" and wasteful practices issue.