Theory of Change: Accelerating a ‘win-win’ international energy transition

For energy security, resilient businesses, and a chance to avoid climate tipping points

A theory of change for consensus-building among a broad coalition, in development by a think tank network of 100+ professionals from energy, finance, sustainability, politics, & interdisciplinary academia

10-Pager

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Est. reading time: 5-10 minutes

Purpose, Request, & Contents

- **Purpose of this project:**
  → Build consensus on shared pathway for international energy transition with broad coalition of decision-makers and experts, catalyzed at Santa Marta conference in Colombia, 24-29 April 2026
- **Request**:
  30-minute conversation to build consensus on common theory of change for Santa Marta conference
- **Who we are**:
  An informal, open think tank network of professionals across sectors including energy, sustainability, and public policy

Contents:

Our analysis: *Climate & Energy in 2026*

The global energy transition is not progressing fast enough to meet Paris Agreement's targets, *though there is potential for acceleration*

1. Global emissions must decline by ~35% by 2035 for 2 °C pathway and ~55% for 1.5 °C pathway of Paris Agreement (compared to 2025)* to avoid tipping points
2. Fossil fuels still count for ~80% of global energy supply. Renewables remain largely **additive** rather than **substitutive.** Fossil fuels are **entrenched in systems** through **path dependency**, creating unfair competition. Recent election results shifted policy & investor trust back towards fossil fuels
3. Carbon removal & capture solutions are significantly underperforming and considered insufficient to close emissions gap within required timelines***
4. Driven by rapid cost declines in **solar** and **battery** technologies, **new "Electrotech" solutions** are proving a **far more efficient and cheaper technology** than **fossil fuels**** and are **overcoming intermittency** problems
5. COP-30 failed to deliver comprehensive plan for international energy transition. Therefore, we created this theory, starting from a best-case scenario outcome and thinking backwards how this can be operationalized. **Santa Marta conference** on **24-29 April 2026** can offer unique opportunity to action this alternative pathway

International scientific consensus indicates that **accelerated fossil fuel phase-out through just transition is possible and necessary** to avoid worst-case climate tipping points

Sources:
*(UNEP, 2025)
** (IRENA, 2025; Walter et al., 2024)
*** (Bradley, 2025; Kerry, 2025)

Our analysis: *Climate & Energy in 2026*

3 scenarios for international fossil fuel phase-out

++ Win-win: a Just Transition for All

*Accelerated innovation and **intra-transitions** of energy companies make business and socio-economic cases for transition clearer, igniting a self-reinforcing feedback loop of global transition, where everyone wins.*

- \+ Lower energy prices
- \+ More clean jobs long-term
- \+ Energy independence
- \+ Fewer microplastics
- \+ Less air pollution

Reduced timescale ↑

We are here →

+− Win-lose: Competition of Renewables vs. Fossil fuels

Fossil fuel companies worldwide continue to lobby inside governments against policies supporting transitions towards electrotech. Meanwhile, solar & battery prices decrease, the competitive edge grows and publicly funded infrastructure slowly shifts towards renewables. A temporary overshoot of climate targets is likely, with significant socio-economic consequences.

Increased timescale ↓

−− Lose-lose: Fatal delays in the transition

A combination of worldwide aggressive lobbying by fossil fuel companies and geopolitical developments delays public support needed to shift infrastructure towards grid electrification. Climate tipping points are triggered, people & planet face crisis escalation & ecosystems collapse.

Our theory of change

*Highlights**

We can accelerate a just international energy transition towards a tipping point of 50% renewables

through processes optimizing innovation and promoting intra-transitions of energy companies

1. Innovation Accelerators

Cooperative networks, inspired by SEMATECH project for semiconductors in 1987-2015, can help to reduce costs and **upscale solutions** internationally to complete final pieces of new energy systems: i.a. **mineral & metal recycling**, **remote-controlled mining, charging stations for electric vehicles**, and **cable & smart grid infrastructure**

Implemented by: **Governments** (first)

2. Intra-transitions

Internal processes of fossil fuel companies to transition from producing mostly (>60%) fossil fuels to mostly (>60%) renewables, accelerate **substitution** in global mix. E.g. Ørsted, Iberdrola

Implemented by: **Energy companies**

3. Feedback loop

Innovation Accelerators & intra-transitions combine into loop of self-reinforcing financial processes, accelerating transition towards **tipping point** of 50% renewables in global energy mix, lower energy price

Implemented by: **All stakeholders**

4. Signals & Coalition

Required to trigger this process:

a) Coordinated communications & plans from **policy** and **institutional investors**, +

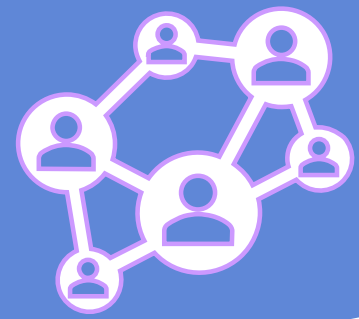
b) Broad funding **coalition** for Innovation Accelerators

Implemented by: **All stakeholders**

It is possible to accelerate a win-win energy transition, where **everyone benefits** more than in the current situation, including people working in fossil fuel industry, worldwide.

** Full theory available upon request*

What is an Innovation Accelerator?



*A low-cost, open **cooperative network** across many countries, in which companies, governments, universities, and non-profits collaborate based on **win-win** logic (**positive-sum**), through a **shared governance framework** to accelerate an innovative transition. This is used for guiding long-term structural change, exchanging communications* and **knowledge** in a **precompetitive / collaborative space**. This network **optimizes the efficiency of innovation** of similar technologies across all different organizations with a **collectively defined mission** and **innovation culture**, with access to **pooled funding** from a broad coalition of funders.*

**For theory on how these communications can be structured, see Appendix 2.*

Sources:
- Mokyr, 2016; Aghion & Howitt, 1992 *(Nobel Prize winners 2025)*
- Loorbach & Verbong, 2012
- Elzinga et al., 2023

Examples include:

1. SEMATECH

Semiconductor research (1987-2005): Massive PPP (Public-Private Partnership) in semiconductor technology combining universities, governments & businesses.

2. ITER

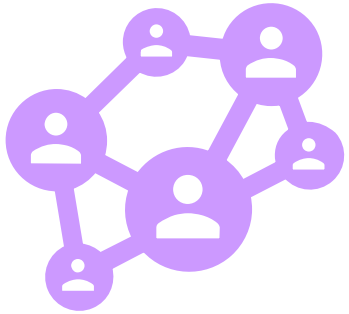
Nuclear fusion (2013-2034): Broad funding coalition for International Thermonuclear Experimental Reactor.

3. Human Genome Project

DNA research (1990-2003): Massive funding coalition in bio-research combining universities, public and private sectors in 7 countries.

Theory:
Part 1

Innovation Accelerators upscale transition solutions & reduce costs for new energy systems

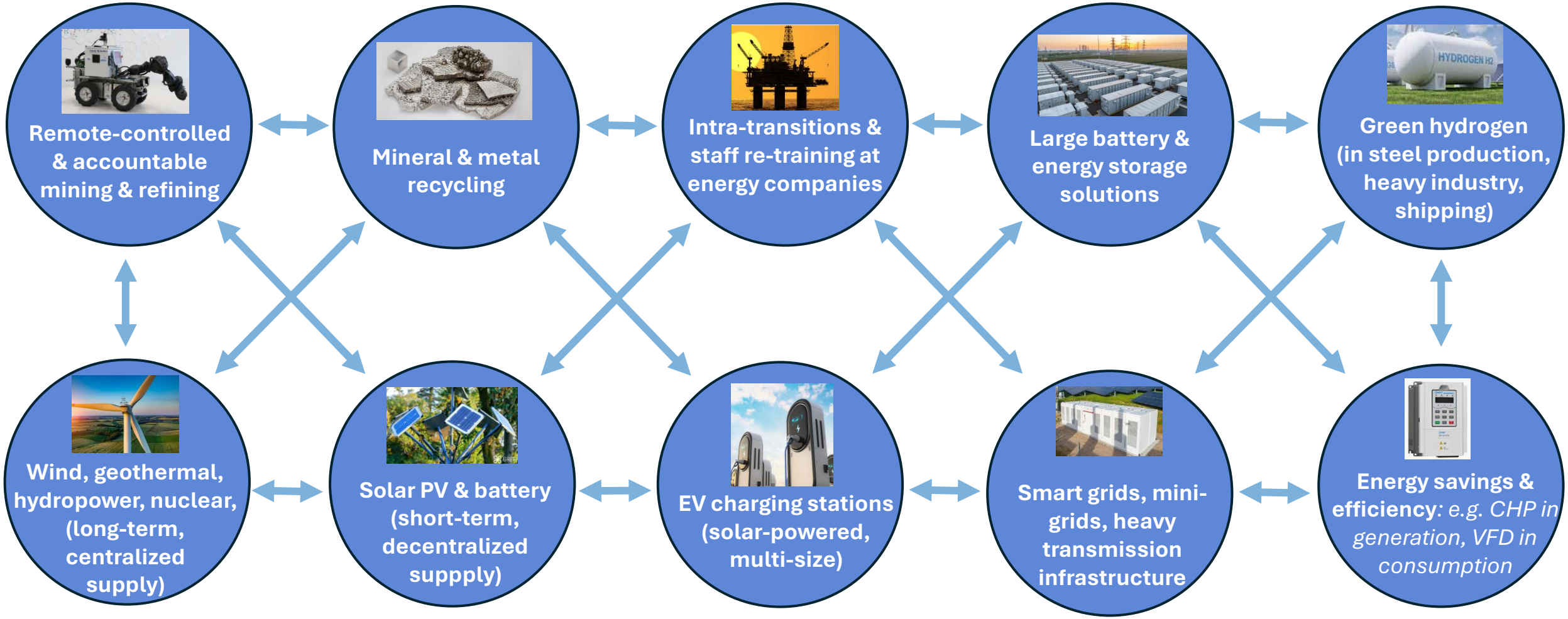


- **Low cost** to construct, thanks to existing communication technology
- **Economies of scale increase**
- **Pooled funding** becomes available for connected projects, e.g. through combined R&D budgets across companies in different sectors, incl. 3rd party funding
- **R&D costs decrease** due to pooling
- **Costs of technology decrease further**, strengthening competition with older technology
- Frequent reporting on collective progress increases **investors' trust**
- **Payback time decreases** and **ROI increases** by accelerated innovation
- **Mission-specific innovation systems** catalyze "solution-directionality" in participants
- **Shared governance framework** is used for guiding **long-term structural change**
- **Patent buy-outs** can be included

Sources:
- Mokyr, 2016; Aghion & Howitt, 1992
- Loorbach & Verbong, 2012
- Elzinga et al., 2023

Theory: Part 1

Ten examples of technologies and solutions that an Innovation Accelerator can include to upscale holistic new energy systems (*most are already operational across the globe**)



*See Appendix 3 for 240 case studies

Intra-transitions of energy companies have been done successfully in recent years

Intra-transition =
Processes internal to fossil fuel energy companies to transition from producing & selling mostly (>60%) fossil fuels, towards mostly (>60%) clean renewables (solar, wind, and battery).

Company	Countries	Intra-transition Status	Description
Ørsted	Denmark	Completed	**Transitioned** from **85% revenue from fossil fuels** to **85% revenue from renewables** in **~11 years** (2008-2019), **without loss of profit**
Iberdrola	Spain	Almost completed	**Transitioned** from >70% fossil fuels in +-2005 to >80% renewables in 2025
ERG	Italy	Completed	**Transitioned** from >90% fossil fuels to >90% renewables in ~15 years (2008-2023), **without loss of profit**
EDP	Portugal	Completed	**Transitioned** from >80% fossil fuels to >90% renewables in ~15 years (2007-2024), **without loss of profit**

A self-reinforcing feedback loop can accelerate process to "tipping point" in worldwide energy mix

Theory: Part 3

Flywheel effect*: *Momentum sustains itself*
+ **Bandwagon effect***: *Critical mass increases itself*

Result: **Tipping point** (>50% clean energy in global mix)

Price of clean energy becomes **lower** than fossil generation → **consumer behavior** shifts

Capital raised **accelerates upscaling** and innovation

Private equity (incl. Venture Capital) crowds in due to higher profit margin

Shareholder and investor trust in clean energy grows larger than in fossil fuels *("Norm cascade")*

Increase in IRR of renewables projects

Innovation Accelerator networks support further **decrease in prices of new energy systems**

Proof of success (media outlets)

Governmental & public finance, grants and donations increase

Substitution Fossil assets phased out or reused for geothermal & hydrogen

Santa Marta conference, April 2026: Catalyst event

Start:

Market & policy signals Coordinated signals by institutional investors demonstrate fact-based business case for investment in clean energy, intra-transitions, and FF divestment, amplified by comms campaigns

"Media Cascade"

Debt financing (derisked through blending) for CapEx of first **large transition projects**

More **energy companies** start **intra-transitions**

Phase 1 (upscaling and proof of concept)

Phase 2 (accelerated transition)

Public capital

Blended capital

Private capital

Policy signals → Appeal for public opinion

- ***Benefits for conservative support:*** *More practical jobs, cheap energy, high profits*
- ***Benefits for progressive support:*** *More clean energy, health & safety for workers*

Sources

- *Meadows, 2008*
- *Finnemore & Sikkink, 1998*
- *IRENA, 2025*
- *Walter et al., 2024*

** For expanded version with advanced dynamics and allstakeholders, see Appendix*

Theory: Part 4

Mobilizing capital at scale to accelerate a win-win energy transition

Phase 1
(Upscaling and proof of concept)

Shared public funding agenda for innovation accelerators

Participating governments align priorities across existing national, EU, and multilateral funds, with focus on the full set of solutions to include in the Innovation Accelerators.

Additional private and public finance for innovation accelerators

Private R&D funds of energy & electricity companies + new public funds are deployed for the development of the Innovation Accelerators.

Blended finance for initial intra-transitions

Public and multilateral financial institutions (e.g. World Bank, EIB, etc.) provide concessional finance, guarantees, and other instruments to derisk private capital and support the first transitions.

Phase 2
(Accelerated transition)

Private capital mobilisation at scale for follow-up intra-transitions

Once proof of concept is achieved, major private investment institutions with patient capital (e.g., pension funds) provide equity and debt financing to multiple energy companies for the transition

Public–private partnerships for decommissioning

PPPs manage repurposing parts of fossil fuel infrastructure and other fossil fuel assets

Public capital

Private capital

Blended capital

How to contribute

At low cost, actors in public and private sectors can help energy mix of >50% renewables arrive earlier

- possibly several years earlier than on current trajectory

Possible contributions by:

→ Governments participating in Santa Marta conference 24-29 April

Help to co-create plans for development of Innovation Accelerators, to reduce costs and upscale solutions i.a. **mineral & metal recycling**, **remote-controlled mining**, **EV charging stations**, and **cable & smart grid infrastructure**

→ completing final pieces of new energy systems internationally

→ Policy-makers

Help to coordinate clear communications to capital markets to invest in renewables and divest from fossil fuels

→ Institutional investors

Publish fact-based written statements on action plans to invest in renewables, because of rising IRR, and divest fossil fuels

→ Experts in i.a. energy, finance, economics, academia

Provide feedback on this theory of change

If we act on this shared theory now, chances to **avoid worst-case climate tipping points**, are increased, with benefit to all

Contact us

- **Where:**
  To help or get more information,
  → **Email** us at energy@unitedfuture.earth
  → **Message** Thij van Aalst, Lucy Buchanan, or Gretel Gambarelli on **LinkedIn**
- **Who:**
  We are an open think tank network of 100+ professionals in i.a. energy, finance, sustainability, academia, and politics
  (coordinated by former United Nations employees)
- **What:**
  We are developing an interdisciplinary theory of change on how to accelerate the international energy transition with benefit to all, building consensus on a shared pathway among a broad coalition of actors