

Societal innovation via multiple value creation - the role for regional authorities and intermediaries

René Kemp

Professor of Innovation and Sustainable Development
UNU-MERIT and Maastricht Sustainability Institute

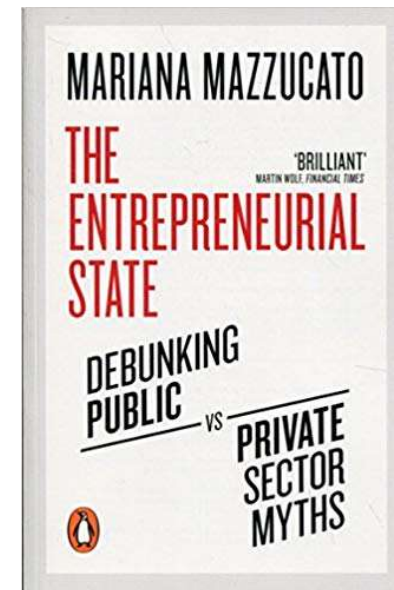
Invited talk for meeting on Understanding and
Managing Industrial Transitions
Brussels, 9 Dec 2019



Inherent difficulties in innovation policy

- Innovation is surrounded by uncertainty, creating a problem for effective policies and thus risk of failure
- Contradicting requirements of innovation: support and selection
- Danger of regulatory capture by innovation actors (scientists, companies, ...)
- A policy world full of policies (with different rationales) that interact with each other (competition policy, environmental policies, innovation policies, ...)
- Ideologies that are not always helpful (government cannot pick winners, ...)
- ...

- A study of Henderson and Newell (2010) into **the role of government support in 4 important sectors** (agriculture, chemicals, life sciences, information technology) found that **“In nearly every sector, federal policy has [...] been critically important in either stimulating or providing demand, particularly in the industry’s early stages.** Policies have also ensured that fundamental research has been *simultaneously creative and useful* – a balancing act that is notoriously hard to pull off – and in **shaping the “rules of the game”** to encourage competition and entry by **new innovative firms”**
- Mariana Mazzucato about the Entrepreneurial State and mission policies



New missions?

- Among innovation experts there is a discussion of whether persistent problems such as global warming warrant mission-oriented programmes.
- According to Keith Smith (2008, p. 2) the answer is yes: “*We now require new large-scale “mission-oriented” technology programs for low- or zero emissions energy carriers and technologies, **resting on public sector coordination and taking a system-wide perspective.***”
- **But are policy makers capable of this?**

*Transition management as
guided evolution*

*by exploiting the **adjacent possible** in
a forward-looking, adaptive way*

Key elements of TM

- **Forward-looking thinking** (visions of alternative systems and new business)
- **Learning and experimentation** by actors interested in alternative systems
- Adapting policies and portfolios that receive support
- Government as facilitator (not a director or just a funder)
- **Institutional support for transition endeavours**
- Putting pressures on non-sustainable regimes (easier to do in case of well-developed alternatives)

TM as used in the Netherlands

- At the heart of the energy transition project are the activities of 7 **transition platforms**.
- In these platforms individuals from the private and the public sector, academia and civil society come together to develop a common ambition for particular areas, develop pathways and suggest transition experiments.
- The 7 platforms are:
 - New gas
 - Green resources
 - Chain efficiency
 - Sustainable electricity supply
 - Sustainable mobility
 - Built environment
 - Energy-producing greenhouse



Platforms	Pathways
<p>Chain Efficiency Goal: savings in the annual use of energy in production chains of:</p> <ul style="list-style-type: none"> - 40 à 50 PJ by 2010 - 150 à 180 PJ by 2030 - 240 à 300 PJ by 2050 	<p>KE 1: Renewal of production systems KE 2: sustainable paper chains KE 3: sustainable agricultural chains</p>
<p>Green Resources Goal: to replace 30% of fossil fuels by green resources by 2030</p>	<p>GG 1: sustainable biomass production GG 2: biomass import chain GG3: Co-production of chemicals, transport fuels, electricity and heat GG4: production of SNG GG 5: Innovative use of biobased raw materials for non-food/non-energy applications and making existing chemical products and processes more sustainable</p>
<p>New Gas Goal: to become the most clean and innovative gas country in the world</p>	<p>NG 1: Energy saving in the built environment NG 2: Micro and mini CHP NG 3: clean natural gas NG 4: Green gas</p>
<p>Sustainable Mobility Goals: Factor 2 reduction in GHG emissions from new vehicles in 2015 Factor 3 reduction in GHG emissions for the entire automobile fleet 2035</p>	<p>DM 1: Hybrid and electric vehicles DM 2: Biofuels DM 3: Hydrogen vehicles DM 4: Intelligent transport systems</p>

Platforms	Pathways
<p>Sustainable Electricity Goal: A share of renewable energy of 40% by 2020 and a CO₂-free energy supply by 2050</p>	<p>DE 1: Wind onshore DE 2: Wind offshore DE 3: solar PV DE 4: centralised infrastructure DE 5: decentralised infrastr.</p>
<p>Built Environment Goal: by 2030 a 30% reduction in the use of energy in the built environment, compared to 2005</p>	<p>GO 1: Existing buildings GO 2: Innovation GO 3: Regulations</p>
<p>Energy-producing Greenhouse Goals for 2020:</p> <ul style="list-style-type: none"> • Climate-neutral (new) greenhouses • 48% reduction in CO₂ emissions • Producer of sustainable heat and energy • A significant reduction in fossil fuel use 	<p>KE 1: Solar heating KE 2: Use of earth heat KE 3: Biofuels KE 4: Efficient use of light KE 5: Cultivation strategies and energy-low crops KE 6: Renewable electricity production KE 7: Use of CO₂</p>

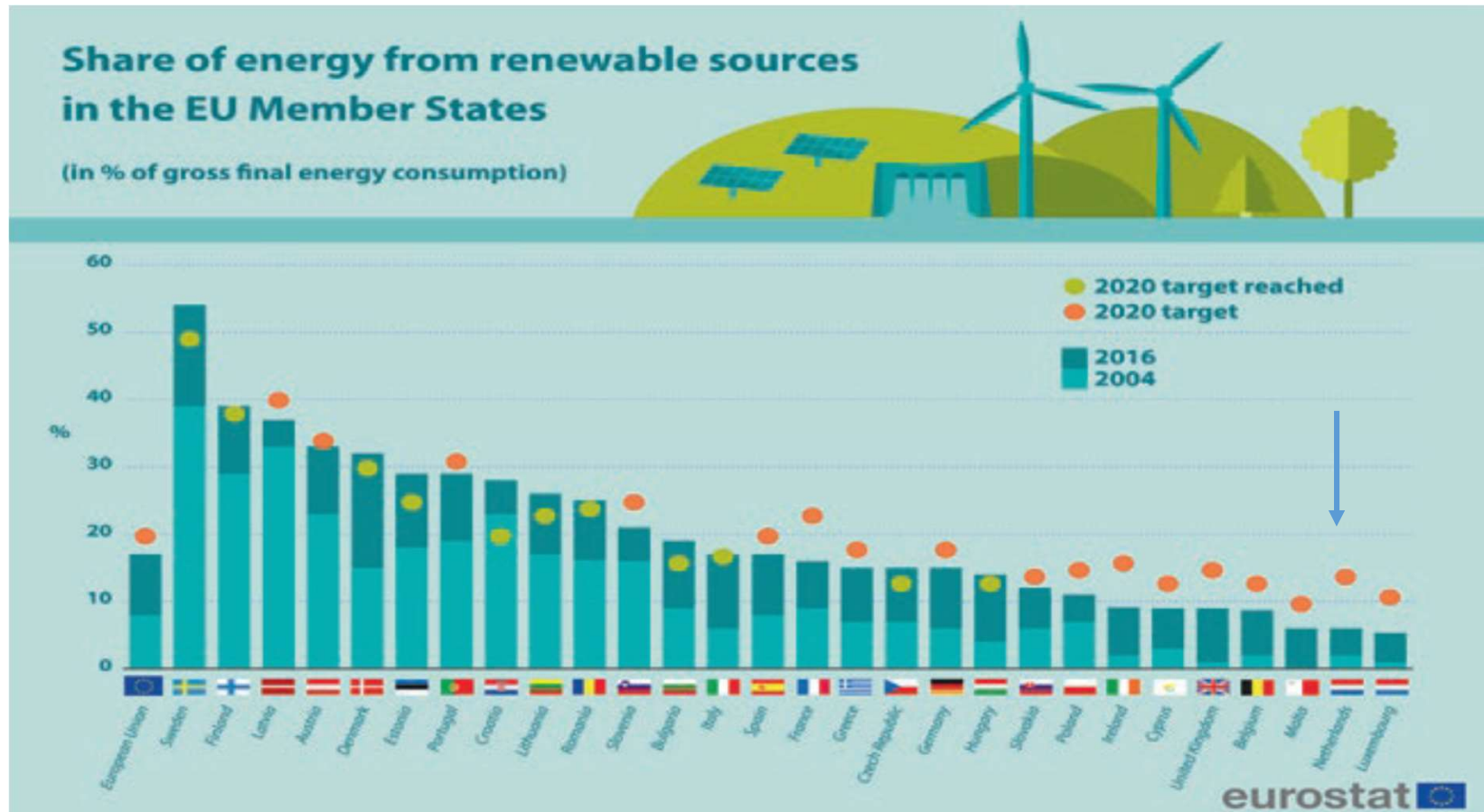
More than technology support

- The transition management approach goes beyond technology support. It is **oriented at the creation of capabilities, networks and institutions for transitional change** through the creation of agendas, partnerships, new instruments, and vertical and policy coordination are part of it.
- The IPE (*Interdepartmental Project directorate Energy transition*) plays an important role in “taking initiatives”, “connecting and strengthening initiatives”, “evaluate existing policy and to act upon the policy advice from the Regieorgaan and transition platforms”, to “stimulate interdepartmental coordination” and to “make the overall transition approach more coherent”

Vehicles for change

- The whole approach is set up as a *vehicle for sociotechnical change and policy change* in a coordinated manner through:
 - The (programming) **activities of transition platforms** and taskforces
 - A **frontrunners** desk for innovators (based at the executive agency)
 - Specially commissioned research into the development of transition paths and prospective innovations
 - The transitions knowledge center (KCT)
 - The competence center for transitions (CCT)
 - The use of transition experiments (UKR)

Shares of energy from renewable sources in the EU



Source: Eurostat (2018) quoted in Turnheim et al. (2018)

Criticisms of transition management as used in the NL

- **Incoherent goals and inconsistent policy instruments** (*policy layering*) (Kern and Howlett, 2009)
- **Too much technology-focussed** (cities and regional authorities not involved)
- Undemocratic: civil society not really involved in it (Hendriks, 2008)
- It is dominated by regime actors (corporatist)
- **Poor policy coordination** (Kern and Smith, 2008); no attempt to phase out (or seriously restrict) fossil-fuel based technologies
- In 2011, it was officially abandoned, replaced by a **backing winners** approach, oriented towards sectors in which the Netherlands was economically strong (“topsectors”).

Transition steering is emergent and erratic

- Depending on **political coalitions** and **economic circumstances**
- The **framing** of issues (public health, costs, new jobs, old jobs, energy security/dependencies, ...)
- Growing/declining opposition to renewable policy and renewable projects
- **Court rulings and other contingencies** (system crises)
- Scientific reports (such as UK Oil & Gas Authority report on fracking, IPCC reports)
- **International obligations and scrutiny**
- Optimal policies only exist in economic text books, agencies struggle with determining good policies and *adjust them to new circumstances*

Fostering green innovation opportunities
through a self-correcting approach with a
low risk of failure
(*which anticipates and cultivates new circumstances*)

Dani Rodrik on green industrial policy

- The prime task for policy makers is *to learn where the constraints and opportunities lie and respond appropriately to these.*
- Regarding the *interaction with business*, he favours a model of “**embedded autonomy**” consisting of ‘*strategic collaboration and coordination between the private sector and the government with the aim of learning where the most significant bottlenecks are and how best to pursue the opportunities that this interaction reveals*’ (2014, p. 485).

- **There are multiple institutional settings within which this kind of collaboration can occur:** *deliberation councils, supplier development forums, search networks, regional collaborative innovation centres, investment advisory councils, sectoral round-tables, private-public venture funds, and so on.* (Rodrik, 2014, p. 485).
- To prevent regulatory capture & inefficiencies, Rodrik advocates “**discipline**” in the use of policy support.
- For safeguarding the public interest and obtaining buy in, policy agencies should be publicly **accountable** as to their failures and successes. “Accountability not only keeps public agencies honest it also helps legitimize their action” (Rodrik, 2014, p. 488).

Three approaches to managed change

- Politically led change (Germany's nuclear phase out)
- From small wins to wider change (NL approach)
- Application of incentives and disincentives

Each with its own problems

- Any big change will create a big problem
- How to overcome opposition from incumbents, old ways of thinking of experts and people?
- How to grow winners?
- Support can not be maintained for ever and may become increasingly expensive to do

The approaches are NOT mutually exclusive

- Big political decisions can be made *when* alternatives are ready for implementation
- The closing power plants and mines can be done **in combination with** a targeted approach for regional diversification/transformation
- Fossil fuel use can be greened (through CCS and energy efficiency)
- Revenues from carbon taxes can be used to fund a green development strategy (can only be done if carbon use is economically viable)

The big question

- What can governments *usefully* & *realistically* do in terms of green industrial policy *given* the priorities for development, institutions for policy making and implementation, weakly developed capabilities in new innovation areas and problems of lock-in?
- *Does the nation (region) concerned have the capabilities to address such issues?*
- **Relevant capabilities** are:
 - i) Capacities for policy making and coordination
 - ii) Mechanisms for implementation and enforcement
 - iii) Policy learning (to adapt policies to new circumstances)
 - iv) An ability to avoid falling prey to special interests, to hypes and short-termism
 - v) a clever form of **rent management** (Tilman Altenburg)

The answer

- No government has those capabilities but they can be given attention and *nurtured*
- Opportunities for transition policy can be cultivated via a *guided evolution* approach
- Innovation platforms, (participatory) road maps (informed by opportunities and landscape changes) and intermediaries help to make a start
- From the literature: Four interrelated strategies for stabilizing a lowcarbon policy orientation are: (1) embed the lowcarbon transition *in a broader transformative agenda*, (2) build societal *legitimacy* for climate policy, (3) encourage the growth of constituencies with a material interest in climate-friendly transformations, and (4) create a supportive ecosystem of institutions (Roosenbloom et al., 2019)

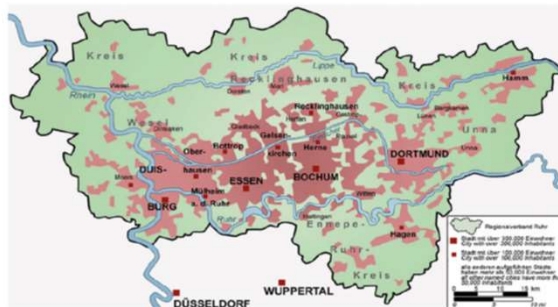
The Ruhr transition as an example of emergent steering

consisted of a three waves of change, which built on each other

1. The **greening of dirty industries** through pollution control and policies for nature conservation which helped to establish an eco-industry (1961-1990)
2. The ecological reconstruction, clean-up and urban **revitalization** of the Ruhr district (1989-2015)
3. The **sustainable energy transition** (2010 onwards)



Ruhr Area within the state of North Rhine Westphalia



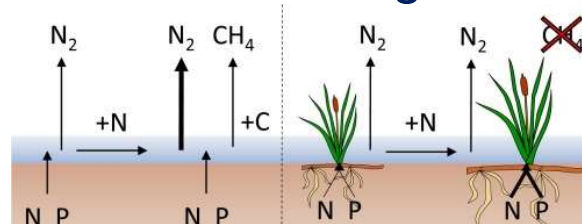
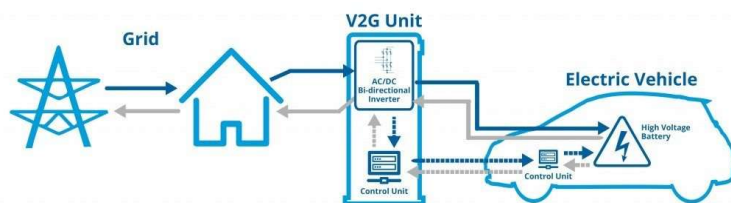
Map of the Ruhr District



Source: Schepelmann, P. Kemp, R. and Schneidewind, U. (2016) **The eco-restructuring of the Ruhr district as an example of a managed transition**, in Hans Günter Brauch - Úrsula Oswald Spring - John Grin - Jürgen Scheffran (Eds.): *Handbook on Sustainability Transition and Sustainable Peace*, Springer, pp. 593-612

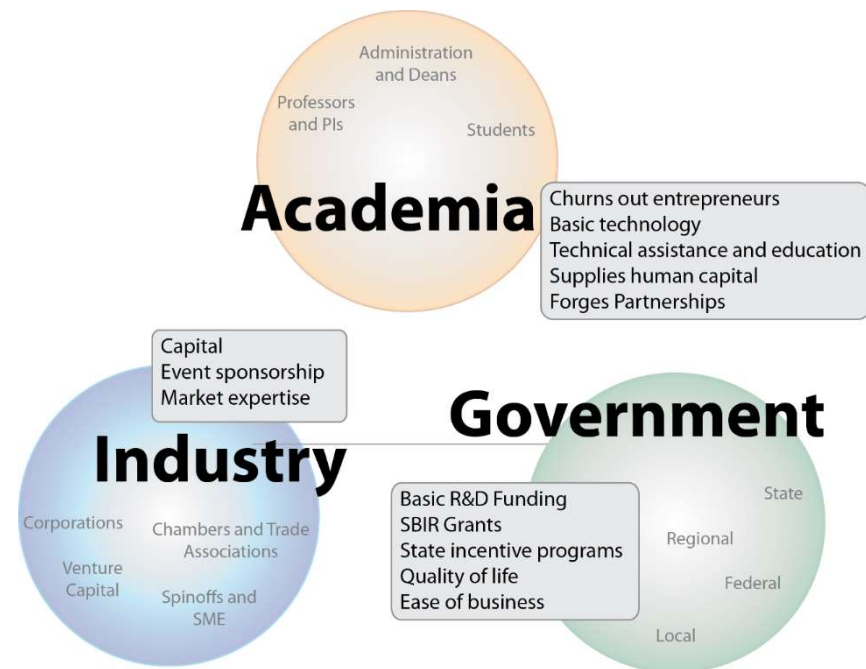
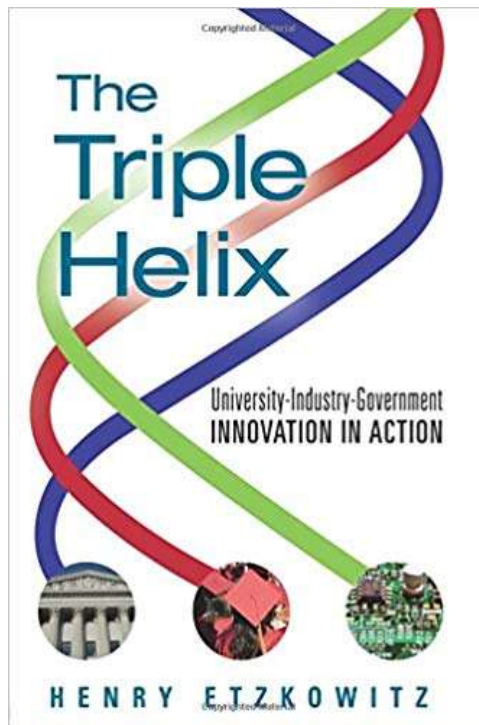
Societal innovation based on multiple value creation

- **Turning problems into something with economic value**
- *Examples are:*
 - Farmers engaged in **nature-inclusive agriculture** and circular agriculture
 - Wood-based housing construction (zero-carbon resource) which can contribute to attractive new forests
 - Valorisation of waste
 - Paludi-culture (crops from wet lands)
 - **Alternative packaging** (cartridge based on FSC-wood, bioplastics and certified aluminum which is easily re-used)
 - **Vehicle-to-Grid (V2G)** and other forms of smart grids

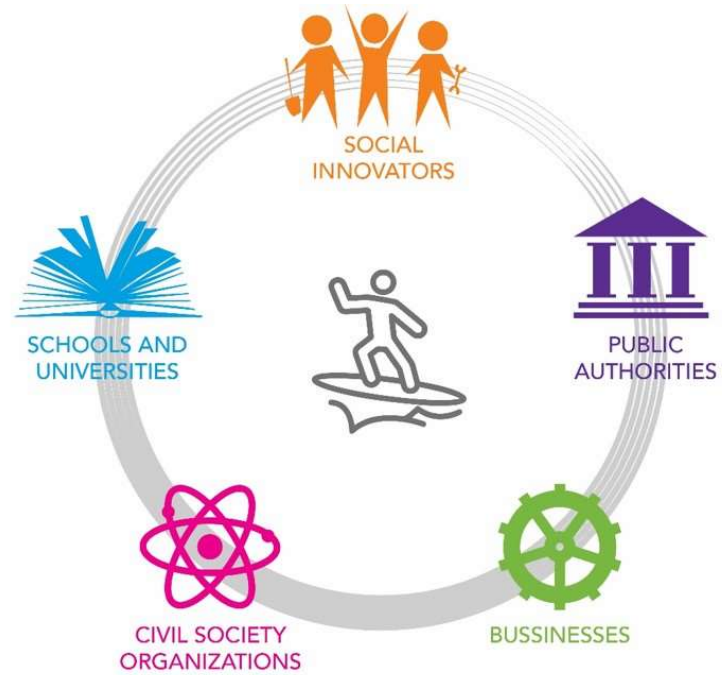


Steering is relatively easy and the costs of regret/failure are small

- Carbon reductions are eligible for support from impact investors and CO2 compensation schemes (money does not have to come from government)
- Government can act as a facilitator (does not have to be in the lead)
- It is associated with immediate gains (in terms of reduced problems)
- Can be done on a *regional* basis (taking advantage of proximity of actors and related variety assets) and exploit *international* economic opportunities (Estonia could commercialise its knowledge about wood-based construction)



A Penta helix



Intermediaries / intermediation

- Intermediaries fulfill **critical functions** wrt *mediating, informing, connecting, coordinating*
- “The intermediary can be an individual actor, an **organisation**, such as a market research agency or the Industrial Biotechnology Innovation Centre (IBioIC) in Scotland, a **network**, as in van Lente et al's (2003) example of the Californian Fuel Cell Partnership, and a **programme**” (Moss, 2009)
- Industrial transitions require *multiple* intermediaries and forms of intermediation
- Next to connecting organisations, they may help them find new roles and strategies (*boundary change*) with the help of *design thinking* which is oriented at business models and product constituencies
- They help to rebalance society (Mintzberg)

Societal innovation [as an architectural innovation] involves exploration, cross-sector collaboration, changes in boundary conditions, the emergence of new business models (based on multiple value creation) and the recreation of modernity (*each of which is necessary for the other aspects to happen and to continue*). **When properly done, societal innovation addresses root causes of unsustainability** (social and institutional conditions that allow for the externalisation of costs to society, the unprofitability of (disruptive) sustainability business practices, and regime actors opting for improvement of existing systems and practices rather than the creation of one new ones).

Source: Diepenmaat, H., Kemp, R., Velter, M. (2019), Why sustainable development requires societal innovation and cannot be achieved without this, paper for Sustainability (special issue "Sustainable Innovation and Transformation").