

Examining the relevance of Transformative Innovation Policy for Green R&D investments

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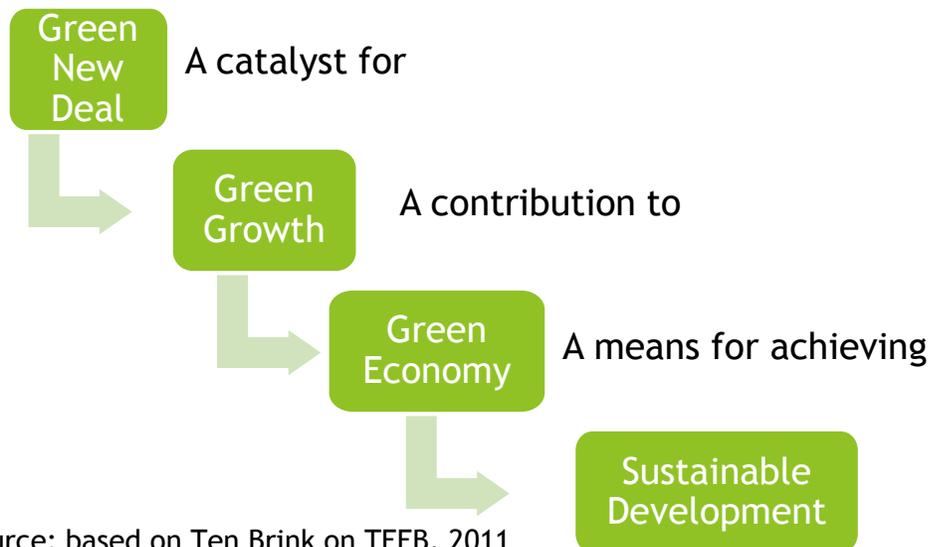
Outline

1. The context for emerging STI policy: Sustainability and Global Challenges
2. An STI approach to Greening the Economy
3. Exploring emerging STI policy approaches
Mission Oriented Innovation and
Transformative Innovation Policy
4. The implications for an understanding of Green R&D
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1. The context for emerging STI Policy approaches: Sustainability, Global Challenges



- ▶ Global challenges of climate change, poverty and inequality: SDG framing
- ▶ The role of Innovation becomes a tool for tackling ‘Global Challenges’
- ▶ STI policy scope and purpose extends/challenged beyond country interest
- ▶ The Green Economy and related concepts should be seen as reviving and strengthening the Sustainability agenda



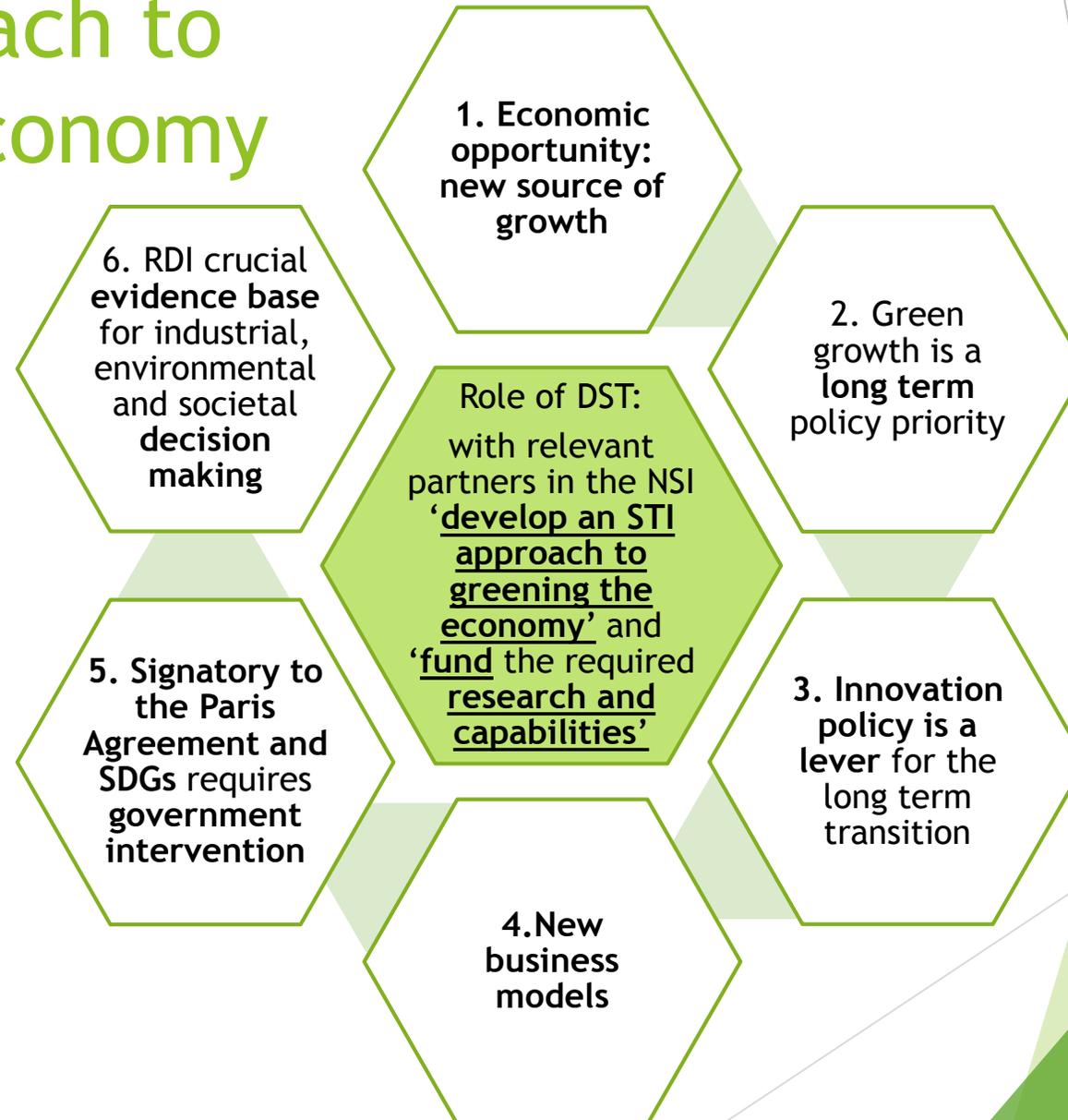
Source: based on Ten Brink on TEEB, 2011

Green Economy related SDG goals

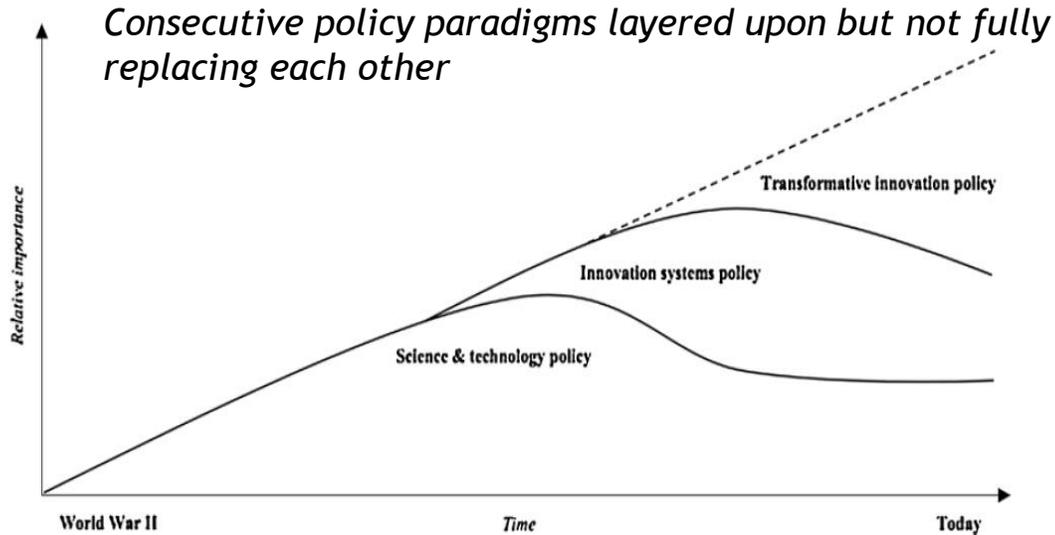


2. An STI approach to Greening the Economy

- ▶ The latest Green Economy thinking and priorities in the March cabinet approved STI White Paper 2019
- ▶ A mix of green economy concepts persists- 'Greening of the economy' becomes the main framing of Green Economy.
- ▶ 'Green innovation' is identified as a driver of job creation



3. Exploring emerging STI policy approaches



Source: Diercks, G., Larsen, H., & Steward, F. (2019). Transformative innovation policy: Addressing variety in an emerging policy paradigm. *Research Policy*, 48(4), 880-894. <https://doi.org/10.1016/j.respol.2018.10.028>

- The view on emerging approaches is through a socio-historical lense
- Often signs of breaking from the National Systems of Innovation thinking tradition
- New challenge beyond national interest shaping the STI framing and tools

	Mission-Oriented Innovation Policy	Transformative Innovation Policy
Summary	Focussing on problem-specific societal challenges, creating of new markets to solve problems and the Entrepreneurial State taking an active role in investment-led growth.	Focusses on new methods and tools for STI policy to address the SDG based on the three frames approach and transforming socio-technical systems.
Thinkers	Mariana Mazzacuto (2018)	Johan Schot and W. Edward Steinmeuller (2018)
Coordinator	Institute for Innovation and Public Purpose at University College London, Bartlett Faculty	Science Policy Research Unit (SPRU) at the University of Sussex in the UK
Who is involved	NASA, Brazilian Ministry of Science and Technology, Innovate UK,	Consortium members are innovation ministries and funding agencies from Colombia, Finland, Mexico, Norway, South Africa (NRF) and Sweden;

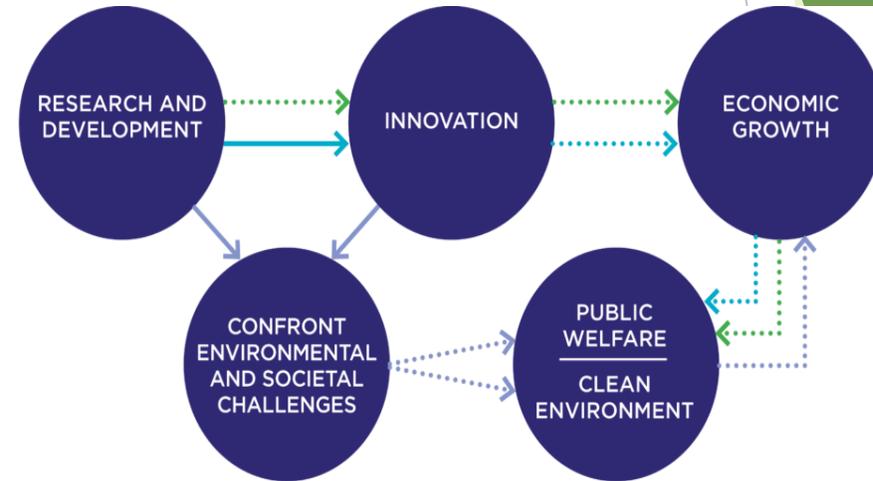
3. Exploring emerging STI policy approaches

Mission Oriented Innovation Policy



Source: Mazzucato, M. (2018). Mission-oriented innovation policies: challenges and opportunities. *Industrial and Corporate Change*, 27, 803-815. <https://doi.org/10.1093/icc/dty034>

Transformative Innovation Policy



→ Frame 1 → Frame 2 → Frame 3
 Solid line = This shows the frame explicitly addresses this aspect (e.g. the link between knowledge creation and utilization in frame 2).
 Dotted line = This indicates that an aspect is assumed to follow (e.g. the utilization of the results of basic scientific research by industries in frame 1).

Source: <http://www.tipconsortium.net/about/>

	Mission-Oriented Innovation Policy	Transformative Innovation Policy
Coordinator	Institute for Innovation and Public Purpose at University College London, Bartlett Faculty	Science Policy Research Unit (SPRU) at the University of Sussex in the UK
Who is involved	Projects with: NASA, Brazilian Ministry of Science and Technology, Innovate UK, Public Banks (BNDES)	Consortium members are innovation ministries and funding agencies from Colombia, Finland, Mexico, Norway, South Africa (NRF) and Sweden;

3. Exploring emerging STI policy approaches

Both frameworks expand the scope and purpose of innovation

	Mission Oriented Innovation Policy	Transformative Innovation Policy
Sustainability	Sustainability becomes the opportunity for economic growth and dealing with climate change and societal and environmental challenges (type of growth needs to be aligned to sustainability)	Literature on sustainability transitions is central to the starting point of the re-orientation and challenge to STI policy
Global Challenges	SDGs put at the centre of MOI as well; global challenges have become a justification for innovation policy	SDGs are put at the centre of STI policy; a new purpose to STI policy
Role of Innovation	needs to respond to global challenges that are social, environmental and economic in nature	Innovation has to also address the global challenges but could be limited in ability to do so
Green Economy	‘active role being taken by governments and transnational organisations to develop strategies for a greener economy can be seen through a mission-oriented lens’	There is reference to industrial systems and circular economy thinking in the TIP framework
Framing the issues/problems	addresses complexity by calling the global challenge issues wicked; but problem identification becomes key to structuring MOI	complexity is also an issue in TIP; a clear pathway is not identified upfront in the ‘problem solving’ happens; the frames approach is layered

3. Exploring emerging STI policy approaches

Process and policy-making differs in terms of actors and capabilities

	Mission Oriented Innovation Policy	Transformative Innovation Policy
Growth	Promotion of investment-led growth; ' governments are looking for economic growth that is 'is smart (innovation-led), inclusive, and sustainable'	Still fundamentally challenges the economic growth model
Markets	Creating of new markets, fixing markets	heavily critical of the current industrial structure and economic growth model itself
Role of the State	Entrepreneurial State; State as capable of addressing market failure issues	a bottom up approach of actors; ministry or agency roles more prominent; less focus on the role of the State
Role of agencies	The studying of agencies and organisation is fundamental to MOI (like a framing 2 in NSI)	Aims not to be trapped in an National Systems Thinking (Frame 2) approach and looks to promote changing socio-technical systems
Evidence	There is an existing body of evidence supporting the theory- she also gives a typology of the success of MOI comparing old and new MOI projects	The body of evidence needs to be built; new knowledge bases are also required
Study success/failure	the study of success cases becomes a basis of the theory	studying failure is key to TIP

3. Exploring emerging STI policy approaches

Common language in theories but different approaches to role players

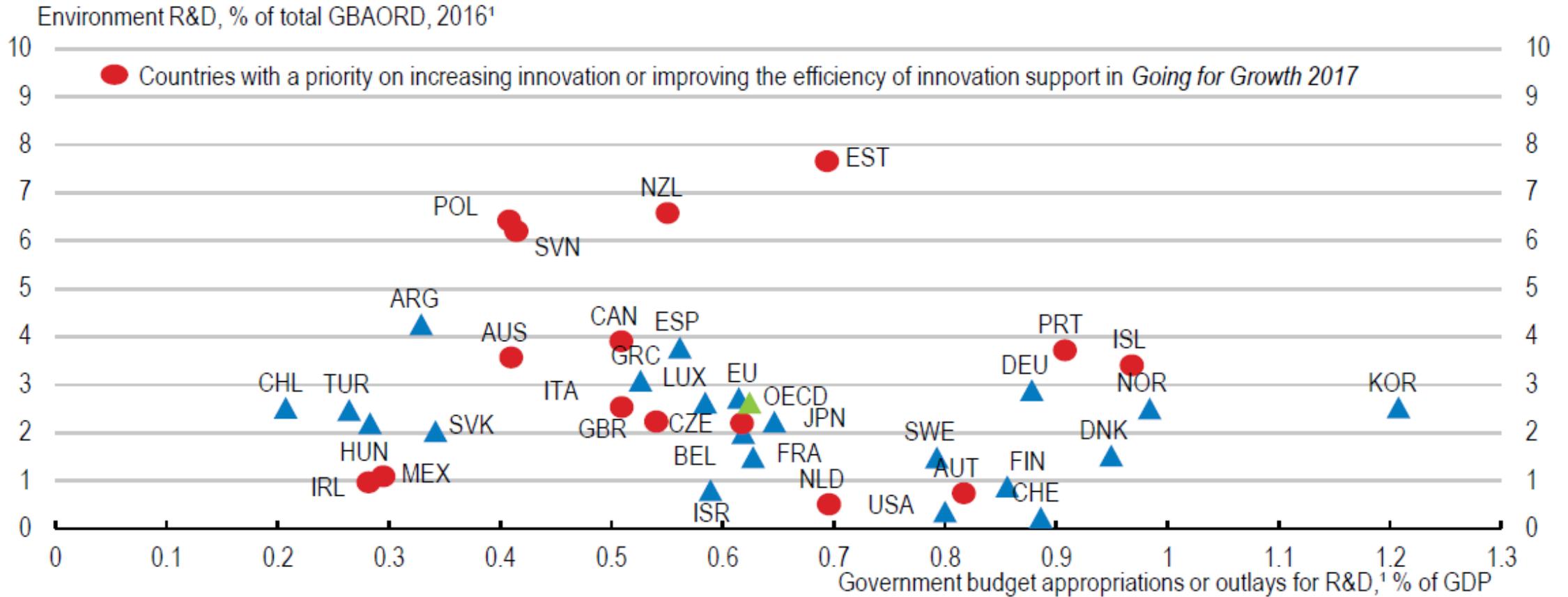
	Mission Oriented Innovation Policy	Transformative Innovation Policy
The type of change	a broad base of users needed in the adoption of new technology (creation of new markets)	Transformative Change of sociotechnical systems
Users	user focus in terms of large numbers/volume need for change and new markets	user-centricity more the focus of STI policy design itself
Diffusion	is central in MOI	mentioned as part of the third frame
Firm	more focus on the firm and the role of the innovation agency	less of a focus on the firm
National Systems of Innovation (NSI)	diagnosis of the NSI and what needs to be changes becomes critical: 'make a precise diagnosis of the technological, sectoral, or national innovation system that an innovation policy wishes to transform'	a fundamental challenge to the NSI approach as identified in the three frames theory; change should be in socio-technical systems
Theory still emergent	evidence base is there- exists in past successes of agencies	evidence is still emergent; theory too is less set
Other new concept	VC like portfolio approach to R&D financing	Deep Transition; multi-level governance failures, sociotechnical transformation

4. The implications for an understanding of Green R&D

1. The STI framework will be based upon a particular view of the Green Economy and how Green Innovation takes place
2. Green Innovation will be the broader concept informing what constitutes Green R&D
3. Green R&D may relate more specifically to a selection of projects/areas of work and capabilities that require investment

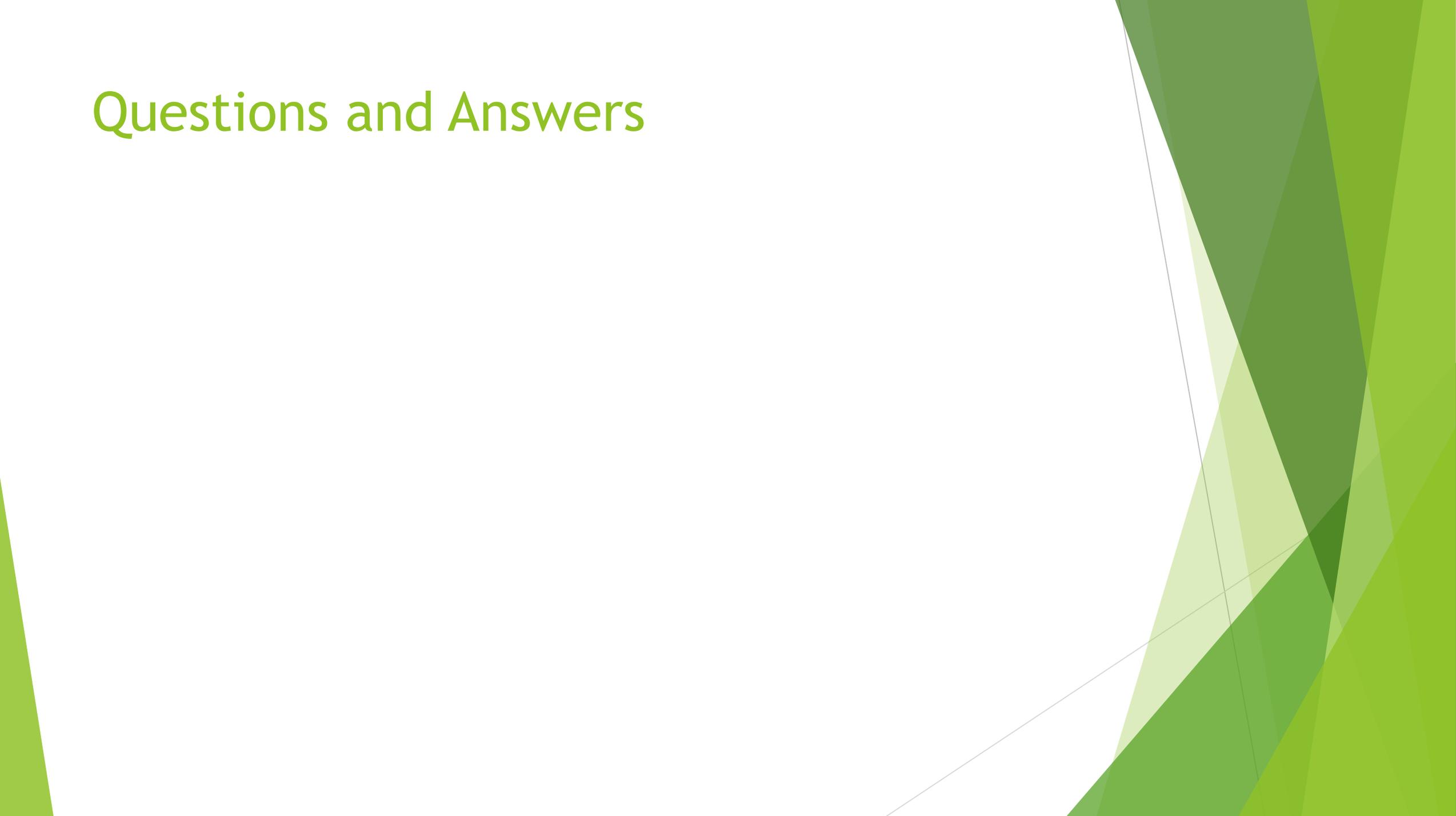
5. Green Innovation measurement

Government R&D expenditure relevant for green growth



Source: <https://www.oecd.org/eco/growth/going-for-greener-growth-what-can-indicators-tell-us-2018-going-for-growth.pdf>

Questions and Answers

The background features abstract, overlapping geometric shapes in various shades of green, ranging from light lime to dark forest green. These shapes are primarily located on the right side of the slide, creating a modern, layered effect. The rest of the slide is a plain white background.