UNIVERSITY OF SUSSEX
SPRU SCIENCE POLICY RESEARCH UNIT
TRANSFORMATIVE INNOVATION POLICY CONSORTIUM

WP 2018-01

AGENDA 2030 AND A TRANSFORMATIVE INNOVATION POLICY

CONCEPTUALIZING AND EXPERIMENTING WITH TRANSFORMATIVE CHANGES TOWARDS SUSTAINABILITY

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Acknowledgements

We would like to thank the following people for valuable inputs and comments on earlier versions of this paper: Jonas Brändström, Rebecka Engström, Shulin Gu, Terttu Luukonen, Göran Marklund, Mariana Mazzucato, Johan Schot, and Richard P. Suttmeier.

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Executive Summary

Increasingly urgent societal challenges are changing the demands on innovation policy. At the same time, and partially as a result, the theoretical approach to innovation policy is shifting from a predominantly market or system failure rationale to a system or transformative change approach. Consequently, government efforts to promote innovation are moving from a more generic, reactive character – in which implicitly all innovation was seen as potentially contributing to economic growth and competitiveness and therefore 'good' – towards a more directional nature, with policymakers seeking to channel innovation efforts and support towards addressing challenges or issues such as climate change, ageing populations, urban development etc. In parallel with these ongoing changes in innovation policy, the recent adoption of Agenda 2030 and the Sustainable Development Goals (SDGs) has put forward a global holistic and integrated agenda for socially, economically and environmentally sustainable development challenging national governments to revisit and reframe their policy orientations, frameworks and processes. In this paper, we establish an important conceptual link between innovation policy and Agenda 2030. Using the example of Sweden, we show how innovation policy and the implementation of the SDGs both depend on and shape each other. Thus, innovation – in a broad sense and on many levels (policy innovation, business innovation, market innovation, organizational and governance innovation as well as technological innovation, and innovation at local, national and global levels of administration) – will be an essential requirement for implementing the SDGs at the same time as Agenda 2030 will necessitate a fundamental rethinking of innovation policy, in terms of its goals, instruments and processes.

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1. Introduction

In the last decades, there has been a growing interest among policymakers and researchers around the world in innovation and innovation policy as a driver of economic growth, competitiveness and job creation. Simultaneously, governments, citizens and companies are increasingly aware of the need for ensuring that development and growth are sustainable – economically, socially and environmentally. So far, however, the role of *innovation and innovation policy* for, and its contribution to, the broad definition of *sustainable development (and growth)* has been ambiguous, or at best, narrowly defined. Innovation is often associated with either the "green" dimension of sustainable development, such as "eco-innovation", or the social dimension, labelled as "social innovation". In terms of innovation and economic sustainability, the relationship between *growth*, including "innovation-led growth" and *sustainability* is far from straightforward and needs to be addressed with considerations of both added-values/benefits, trade-offs and even destruction. As some recent research points out, innovation may become as much part of the problem as the solution when it generates both creative destruction and destructive creation. Soete (2012) and Schot and Steinmueller (2016), have sought to incorporate this ambivalent and open-ended nature of innovation into a more contextual and holistic thinking about science, technology and innovation policy (Soete, 2012 and Schot and Steinmueller, 2016).

While it has become increasingly widely accepted that innovation is important, even critical, for economic development, the understanding of innovation processes in the economy and how these can be influenced by policy, is far from well-developed. Recent theoretical development and empirical observations have shed new light on both *the source and the sustainability* of growth and competitiveness. In particular, there is a growing realization that ecological and environmental soundness as well as social cohesion and equality are no longer only necessary framework conditions but also strategic drivers of long-term growth and competitiveness. This implies that innovation policy as an integral part of growth policy can no longer be the non-directional promotion of innovation for growth and competitiveness. International think-tanks and multilateral organisations such as the OECD, the IMF and the UNEP have put forward ground-breaking policy frameworks and analysis to address both the issue of directionality and the need for new thinking and approaches regarding the drivers and the sustainability of economic growth. The Green growth strategy (OECD, 2011), The inclusive Green Growth (OECD 2012), New Approaches to Economic Challenges (OECD 2016a) and the policy analysis on Rethinking Macroeconomic Policy (IMF 2010 and 2013) as well as Design of a sustainable financial system (UNEP Inquiry, 2015) are all important contributions to this new wave of thinking on economic growth and policy-making.

In addition, two parallel developments in the field of sustainability on the one hand, and innovation policy on the other, address the above-described ambiguity and the need for directionality of policies for innovation and economic growth. They also open up new perspectives to advance the research agenda on an integrated innovation-sustainability policy narrative and approach.

The first one is the adoption of Agenda 2030 by 192 state leaders worldwide at the United Nations General Assembly in September 2015[1]. The Agenda consists of 17 sustainable development goals (SDGs), comprising the economic, environmental and social dimensions of growth and development and including 169 specific targets for concrete policy objectives and action points. It aims to be an *ambitious*, *integrated* and *universal* policy agenda for sustainable development, with the potential of bringing about a paradigm shift in the current view on and approach to creating a sustainable future. The implementation of Agenda 2030 is thus to design, manage and deliver a process of transformation towards sustainability.

The second development is the emerging new framing of innovation policy and new configuration of the policy mix towards, firstly, a systemic and, secondly, a societal-needs and development-focused approach, which Schot and Steinmueller (2016) among others, label '**a Transformative Innovation Policy**'. The term refers to policies that support and generate transformative changes at a system level. Such policies include new innovation processes, new models for partnership and governance, market creation, and behavioural, institutional, organizational and regulatory changes,. This new policy framing not only broadens the *concept of innovation,* but also puts emphasis on the *direction of innovation* – which is often defined by societal needs and challenges (for a discussion on system innovation, see OECD 2015a; for analyses of the changing focus and nature of innovation policy see, for example, Martin 2015, Perez 2013, Lundvall 2012, Frenken 2017, Edler and Nowotny 2015, Mazzucato 2016 and 2017, and Schot and Steinmueller 2016).[2]

Given the common objectives and the system focus embedded in both Agenda 2030 and a Transformative Innovation Policy, we see clear connections and synergies between the two. They could be argued to be a perfect match for pursuing an innovation-driven transformative change towards sustainability. A Transformative Innovation Policy is essential for Agenda 2030 – with its system perspective and as a vital means for ensuring its implementation. Agenda 2030 is equally important for the development of Transformative Innovation Policy – as a legitimate and comprehensive policy framework for conceptualising and experimenting with innovation-driven transformative changes in practice. A successful integration of these two can fundamentally enhance both *depth* and *scale* as well as *speed* of transformative changes towards a sustainable society and a sustainable future. However, so far, there have been few attempts to link these frameworks conceptually or practically. Rather they seem to coexist in parallel universes both in research and in policymaking. Thus, innovation policy research and practice continues to be dominated by premises of market and system failure, while Agenda 2030 is often equated with and appropriated by experts and practitioners of environmental policy and the social dimension of sustainability, on the one hand, or development aid communities on the other. Furthermore, innovation policy often falls under the jurisdiction of ministries of

[1] For more information, see e.g. "Transforming our world: the 2030 Agenda for Sustainable Development", (United Nations, 2015). http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E

[2] See e.g. "System Innovation: Synthesis report" (OECD, 2015) and "Framing innovation policy for transformative change: innovation policy 3.0." (J Schot, and W. Steinmueller, 2016).

economy, industry, research or education, while responsibility for Agenda 2030 is commonly assigned to ministries of foreign affairs, development aid or finance (Lundin and Schwaag Serger 2016). The segregation between the two concepts, in terms of theoretical approaches and policymaking, is an impediment for both policy realms. Our paper hopes to contribute to bridging this gap, both from a conceptual and policymaking perspective, as a vital prerequisite to enable the successful pursuit of both.

1.1. About this paper

While there is a growing body of literature on transformative change and system innovation, few papers have applied these integrated approaches to Agenda 2030, particularly not within the context of policy-making for innovation-driven sustainable development and growth. This is noteworthy given that Agenda 2030 – due to its holistic and integrated nature – could be described as an ideal – and perhaps definitive – framework for application of system innovation theory and practice in real-world policymaking. Against this backdrop, we have two groups as target audiences in mind for this paper. The first is the **innovation research and policy community,** which is increasingly moving towards transformation-oriented agenda-setting for innovation policy. This includes re-examining the role of the government and the public sector. However, there are still clear conceptual and implementation gaps when it comes to bringing innovation policy to the heart of sustainability-driven transformation.. The second is an emerging and highly diverse **"Agenda 2030 policy-making and implementation community".** This group will play an increasingly strategic and important role of integrating different policy areas and reframing a future-oriented policy framework for sustainable development and growth. Conceptually, innovation policy, particularly the current trend towards a transformative innovation policy, has much to offer to these efforts, in particular in building 'transformation literacy' among Agenda 2030 policy makers and practitioners. Paradoxically it is so far disconnected from the policy-making processes of this group.

This paper aims therefore, to contribute to the analytical framework and policy-oriented discussion, in the following aspects, through integrating Agenda 2030 and a system-oriented Transformative Innovation Policy:

- Bring the conceptual and academic discussions on *both sustainability transition and transformative innovation policy into the context of Agenda 2030 implementation*. This can illustrate the conceptual insights and research questions in a more concrete and policy-relevant manner.

- Elaborate the interpretation of Agenda 2030 from a *system-oriented transformation perspective,* which can have important implications on how a national implementation strategy for Agenda 2030 can be defined. This, in turn motivates why a transformation-oriented mind-set and a system innovation approach will be a successful factor for implementation of Agenda 2030.

Having established this conceptual link, we analyse the current processes and efforts in Sweden as an example of a country attempting to integrate Agenda 2030 and innovation policy in a country-specific and an operational context. The Swedish case is of particular interest for the following reasons:

- Sweden has been an early adopter of both challenge driven innovation and experiments with the system innovation approach with the aim of addressing complex/cross-sectoral transformative innovation.

- Sweden is ranked as one of the most innovative countries in international comparisons with mature and overall well-functioning institutional and framework conditions for innovation and a strong policy focus on innovation.

- Sweden has been relatively successful in combining social, economic and environmental sustainability in the past decades. Thus, it has been able to combine relatively low income inequality with solid economic growth – particularly compared to other mature economies, and the pursuit of rather ambitious environmental goals.

- The Swedish government has demonstrated a clear ambition for an innovation-driven Agenda 2030 implementation.[3]

The combination of these factors makes Sweden a valuable empirical case for studying policy development towards a system innovation driven implementation of Agenda 2030.

2. Innovation policy and system innovation for transformative changes – beyond the national innovation system approach

Faced by an apparent lack of urgently needed strategies and actions towards sustainability-driven transition/transformation in the policy field, there is a need for a science-based analytical framework for policy- making. The evolving theoretical frameworks in the fields of *sustainability transition* and *transformative innovation policy* provide an important inspiration for policy debate and development. In this section, we try to highlight some of the key elements and insights from these ongoing research fields as well as their policy implications.

A sustainability transition is defined as a "*radical transformation towards a sustainable society, as a response to a number of persistent problems confronting contemporary modern societies*" (Grin et al 2010). Innovation and innovation policy might be expected to play an important role in any transformation process towards sustainability, innovation and innovation policy play a central role. Both paradoxically and problematically, however, the innovation-driven aspiration

[3] For more information, see "Sweden and the Agenda 2030 – Report to the UN High Level Political Forum 2017 on Sustainable Development", (Government Offices of Sweden, 2017) and "Getting Government Organised to deliver on Agenda 2030 and the SDGs", pp. 6-7 (Lundin, 2017).

and innovation policy have not yet become an agenda-setting pivoting force for forming a future-oriented policy agenda for sustainability transition – at least when looking at the on-going processes of many OECD- and non-OECD countries' preparation/planning for implementation of Agenda 2030. This can be explained by a combination of a few factors, for instance:

- While complementarities between *technologies, organizations or institutions* are key for sustainability transitions (Markard and Hoffmann, 2016), the focus of innovation policy is still largely centred on technologies, even though awareness of and an experimental approach to addressing organisational and institutional aspects as well as an "agent/actor perspective" are increasing.

- To be able to address organisational and institutional aspects of innovation, either sector-or system-wise, innovation policy and its implementation need to be embedded in *an extended and deepened institutional and policy context,* i.e. innovation policy as part of policy mixes for transitions over several policy domains (Kivimaa and Kern, 2016). Innovation policy for sustainability transitions needs to be addressed in terms of policy mixes, rather than individual instruments (Flanagan et al., 2010; Rogge and Reichardt, 2016; Veugelers, 2012). This is particularly true when it comes to sustainability-driven innovation, given its comprehensiveness and cross-sectoral nature. Innovation policy is, however, still mostly framed and placed in an industrial policy and a sectoral renewal context for competitiveness and job creation, rather than a whole-of-government engagement and a "whole-of-society" transformation towards economic, social and ecological sustainability.

- There is rich literature in the field of sustainability transition that addresses the underlying dynamics of transition. But it is increasingly apparent that transition is also an *outcome of a public policy processes* – in which there are barriers, resistance to transition as well as opportunities to initiate and accelerate transitions (Tshangela and Swilling, 2017). In this context, policy process and policy innovation play a central role – but an analytical framework and empirical evidence for a better understanding of this is still lacking.

- Both in the research and policy context, the "innovation community" and the "sustainability community" are still two largely separated and segregated worlds – even though there are efforts to establish aligned analytical frameworks and integrated implemental approaches. A significant body of research focuses on the ecological dimension of sustainability transition and innovation, often with a focus on energy and climate-related issues (e.g. Kern and Howlett, 2009, Kivimaa and Virkamaki, 2014, Laestadius, 2015, Geels et al. 2016, Markard and Hoffmann, 2016, and Lauber and Jacobsson, 2016 etc). But we do not find research that has tried to link a holistic approach to sustainability – as the one taken by Agenda 2030 – to innovation. Similarly, so far, very few countries have consciously linked innovation and Agenda 2030 in a policy context. Given both the early stage of and a clear need for this such an aligned perspective

and integrated approach, Agenda 2030 provides a perfect learning-by-doing framework and experimental space for this purpose.

In the innovation policy research community, the conceptual and theoretical frameworks have shifted from a focus on *market failure* (e.g. Arrow, 1962) and *system failure* (e.g. Freeman, 1987, Lundvall, 1992, Etzkowitz and Leydesdorff, 2000 and Klein Woolthuis et. al., 2005) towards *transformation failure.* Transformation failure seeks to explain why significant advances in technology do not result in disruptive innovation and systemic change (eg Weber & Rohracher 2012). It also examines the role of innovation and innovation policy in addressing societal challenges and driving transformative change. This can include arguing for greater directionality in innovation policy and / or a mission- or challenge-oriented approach (see, for example, Mazzucato 2017, Kuhlmann & Rip 2014 and 2016, Edler and Nowotny 2015, European Commission 2017) This involves a process of elaboration of societal challenges into a politically supported agenda, where concrete public policies and private initiatives, interact.

The conceptualisation of "*system innovation*" – with a dynamic multi-level perspective, has been a promising step forward to address transformation failures (See a graphic illustration in Figure 1 below). The OECD synthesis report (2015a) defines system innovation as follows:

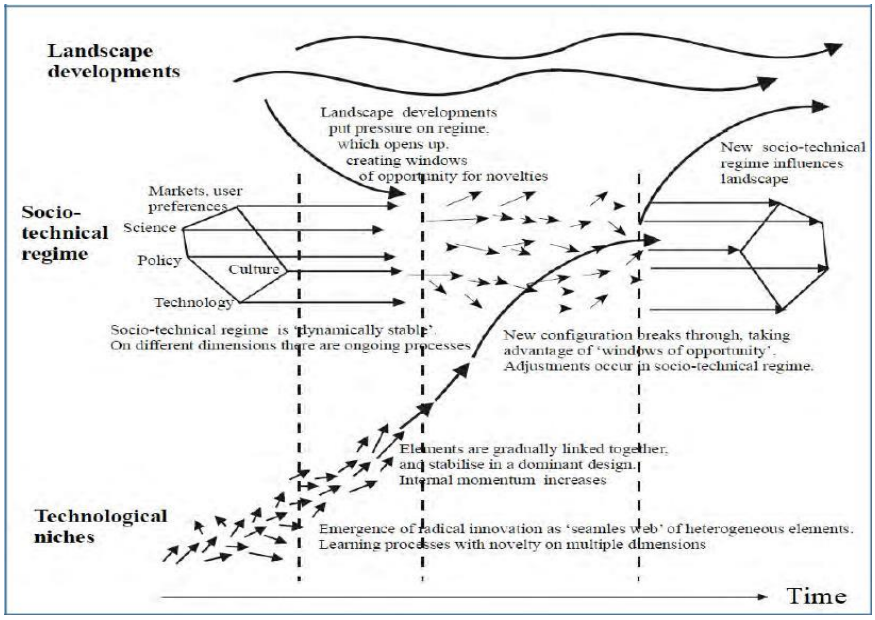
"…a radical innovation in socio-technical systems which fulfil societal functions, entailing changes in both the components and the architecture of systems" (p15) and interprets it as "a broad concept that helps us frame our thinking, and sharpen our understanding of socio-economic and technological transitions and the role of policies. It is mission-oriented and can have important, and even radical, implications for the way we think about policies today" (p14).

The multi-level perspective (MLP) (Rip and Kemp, 1998; Geels, 2002; 2005; 2012) on system innovation recognizes that the process of generating radical and system-wide changes consists of dynamics at and interactions between three levels:

- Landscape developments, i.e. the "macro" or overall social, political and economic setting within which the system
- Socio-technical regime, i.e. the collection of actors and configurations that comprise the system.
- Technological niches, i.e. individual niche innovations.

The path and outcome of the system changes/transitions depend on interactions and are very much conditional on suitable alignment between the various levels.

Figure 1. A dynamic multi-level perspective on system innovations



Source: OECD (2015a), adapted from Geels, 2002.

This conceptualization of system innovation could constitute "important milestone for the transition community" (OECD, 2015a) as well as a bridge for innovation policy towards sustainability transition. However, an ex post analysis (Diercks, 2017) shows that it is far from straightforward to institutionalize a system innovation approach in the practical policy-making process for sustainable development and growth – despite the fact that the concept is both intellectually appealing and fits the need of the policy environment/context well. Two analytical insights explain the "implementational failure" as well as highlight the necessary conditions for applying system innovation to sustainability transition.

- **Alignment of policy strategy and instrument mix**: According to Rogge and Reichardt (2016), new policy goals of system innovation, i.e. systemic changes, cannot be met only by applying existing policy instruments. In the terminology of the transition literature, the tendency to do so is referred to as *policy drift*, i.e. a situation where new goals replace old ones without significant changes in the instruments used to implement them (Kern and Howlett, 2009). Thus, there is a need for and some evidence of emerging active ongoing academic research that can be applied and tested for putting forward a new "*system innovation toolbox*".

- **Creation of instrument mix and organizational and institutional changes**: system innovation needs to be implemented and supported by necessary organizational and institutional changes – which in turn may underlie any significant changes in policy/instrument mix.

Nevertheless, in the on-going planning and implementation process, the Agenda 2030 policy community is still very removed from the innovation policy community. This can be illustrated in a survey among 32 OECD-countries and OECD partner countries (See Lundin and Schwaag

Serger 2016 and survey results in Table 1 below). In many of these countries the responsibility for Agenda 2030, in terms of both strategic implementation design and policy coordination was originally placed under the responsibility of ministries of foreign affairs, development or finance, i.e. ministries which – in many countries – tend to be quite far removed from innovation policy.

Table 1. Agenda 2030 implementation of Agenda 2030 - Leadership and Co-leadership with and without Centre of Government (CoG) (32 OECD and partner countries)

	Leadership by the CoG	Co-leadership b/w CoG and line ministries	Leadership/Co-leadership without CoG	Other
Subtotal	**10 (31%)**	**10 (31%)**	**11 (34%)**	**1 (3%)**
Prime Minister's/ President's office	Czech Republic, Estonia, Finland Greece, Japan Malaysia, Mexico, Slovenia, EU, United States			
Ministry of Foreign Affairs		Australia, Austria, Iceland Peru	Belgium, Hungary Netherland	
Ministry of Development			Turkey, Switzerland, UK	
Ministry of Environment		Lithuania		
Ministry of Foreign Affairs & Ministry of Finance			Denmark, Sweden, Norway	
Ministry of Foreign Affairs and Ministry of Environment		France, Ireland	Luxemburg	
Ministry of Foreign Affairs, Ministry of National Planning		Costa Rica* Latvia		
Ministry of Environment & Ministry of Development		Germany	Chile	
Ministry of National Planning				Colombia

** Ministry of Environment is also included for Costa Rica.*

More recently, the link between innovation policy and sustainability transition is more explicitly expressed in terms of "*transformative innovation policy*", i.e. beyond market failure, policy failure and system failure, this new framing of innovation policy puts a new emphasis on *directionality failure*. From a policy perspective, including research and innovation policy, Agenda 2030 is an urgent, inclusive and value-creating direction towards sustainability that calls for both research efforts and new policy approaches. Agenda 2030 thus constitutes a timely and urgent impetus propelling research and innovation policy further in this direction.

It is also critical to underline that sustainability cannot be achieved by merely expanding or optimizing existing systems. A "*deep transition*" is needed, i.e. a series of connected fundamental transformations of a wide-range of large-scale and long-term socio-technical systems (Schot, 2016; Schot and Kanger, 2016. Weber and Rohracher, 2012). The research into this topic speaks of 'transformational failures' that impede systemic change, as opposed to the market or system failures emphasized by innovation policy researchers earlier. In other words, a successful implementation and fulfilment of Agenda 2030 needs to be a process of generating

and materialising a deep transition. In such a process, *a complexity-theoretic perspective* (Frenken, 2017) is highly relevant – from both analytical and policy-making viewpoints and two key elements of this new perspectives are particularly useful:

- **The notion of knowledge:** innovation in this complexity-theoretic perspective is a process where cognitive distances between individuals are to be overcome and one of the central mechanisms in the growth of knowledge is to recombine existing artefacts, knowledge and capacities in *new and more complicated/creative ways*.

- **Unrelated-diversification strategy**: the above notion of knowledge implies that innovation patterns are *highly cumulative and path dependent*. For instance, countries develop their economy by diversifying into export products closely related to what they already export. Governments will, in turn pursue innovation policy that will almost automatically promote related, rather than unrelated diversification. A transformative innovation policy needs to find new ways of breaking up such path-dependencies through an unrelated-diversification strategy, i.e. going beyond the "related" combination and collaboration in the established product/services spaces. This can be done through, e.g. 1) promoting crossovers between unrelated technologies or industries 2) moving away from existing capacities *viz*. interest at the supply-side to articulate new needs at the demand-side. At the same time, a policy is needed that aims to *change institutions*, which generally requires involving new actors as well as risk-taking by the government itself, rather than to reinforce existing actor positions, institutional arrangements and government roles. One way of doing this to create new spaces for socio-technical experiments (European Council 2016).

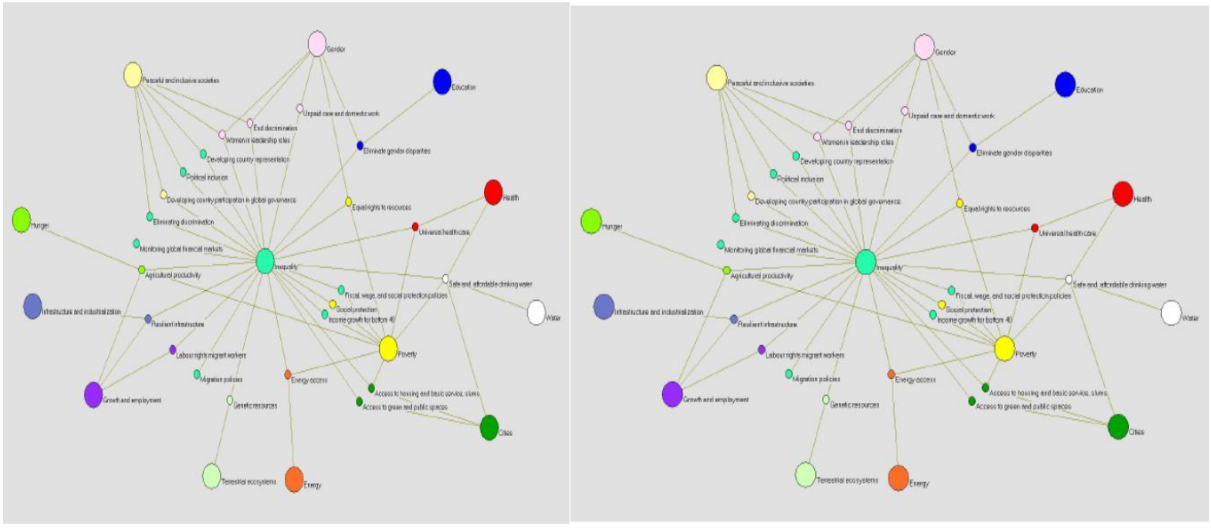
The research agenda discussed above does not necessarily give straightforward answers or "turn-key" solutions to the on-going institutional and policy development required for Agenda 2030 implementation. Some of the analytical framework is still in an early development stage. But they do provide intellectual and conceptual insights on what the key building blocks/elements are, for creating a transformation-oriented institutional capacity and implementation strategy. To introduce a *"system innovation for sustainability transition"* thinking and approach to the policy-making and implementation process of Agenda 2030 is a challenge – but it can be a "game -changer" for a truly ambitious and transformative policy development. At the same time, the learning-by-doing process of Agenda 2030 implementation will also feed the on-going research on sustainability transition and transformative innovation policy with institutional and policy insights to finetune and advance the research agenda. In other words, given the premature nature on both sides, research and policy development for sustainability transition and transformative innovation need to be truly mutual learning and supportive processes.

3. Agenda 2030 – a system-orientated transformation perspective on its implementation

Agenda 2030 is a highly ambitious and complex policy agenda – not least from a perspective of transformation. The previous and ongoing transformations, such as the industrial revolution or digital revolution started by technological breakthroughs. Agenda 2030, aiming at bringing about transformative changes is more profound in the sense that these changes will not only be technology-driven. Instead, fundamental changes of the current economic, social and ecological systems need to take place, both in parallel and in an integrated manner – both to tackle undesirable consequences from the past and to create new pathways and opportunities towards the future. In other words, this comprehensive *sustainability-driven* policy agenda is an expression of "the need for integration of different perspectives and the recognition that sustainability is a process, not an end-state" (Robinson, 2004).

The integrated and process-oriented nature of Agenda 2030 and its SDGs can be illustrated/exemplified in different ways. For instance, close linkages among different SDGs and targets can be illustrated with the help of a cluster analysis. Two of the most illumining examples are the "SDG-network" of SDG 12 sustainable production and sustainable consumption and of SDG 10 reduced inequality (See Figure 2 below).

Figure 2. A network of SDGs – SDG 12 and SDG 10



Source: D. Le Blanc, 2015.

Sustainable production and consumption are often considered two separate issues and mainly related to the environmental dimension of sustainable development. In the framework of Agenda 2030, the production and the consumption sides of the market are now interconnected, with clear links with a large number of policy fields, such as health, education and economic policy that are beyond the traditional view from an environmental perspective only. Similarly, the inequality in the Agenda 2030 framework in no longer only an economic and re-distributional issue. Instead, a multidimensional view on both the causes and the consequences of inequality calls for proactive policy actions related to various sectoral policies, growth policy, education and health.

The examples of various clustering exercises underline the central role of *a system perspective* embedded in the Agenda 2030. Many of the SDGs are interconnected and interdependent and thus they require new cross-cutting, inter- and multidisciplinary approaches. This has far-reaching ramifications for economic policy, industrial policy, education and research policy as well as regulatory frameworks and governance systems.

This also means that implementation of Agenda 2030 needs to be a highly innovative process, which goes beyond a business as usual scenario and current path-dependent systems. This way of looking at SDGs is also in line with the reasoning on both related and unrelated diversification strategies by Frenken (2017) to promote innovation development from a complexity-theoretic perspective. However, the "relatedness" or "un-relatedness" will be defined and guided by serval dimensions, i.e. by a science based approach, a complex challenge-driven policy agenda, empirical observations from innovation practices, or a combination of these different dimensions.

However, the intellectual as well as the implementational challenge is how to both *simplify and internalise the complexity* to make a system-oriented approach *communicable, policy-relevant and actionable*. In this paper, we highlight and elaborate two aspects of such a system -oriented approach that are essential for innovation-driven transformative changes associated with the implementation Agenda 2030, with a specific focus on *the institutional and governance related aspects* as well as the *role of the public sector* and *public agencies*:

- The transformative change of the current view on *growth framework/strategy and its outcome.*
- The transformative change of the *institutional set-up* and *governance practice.*

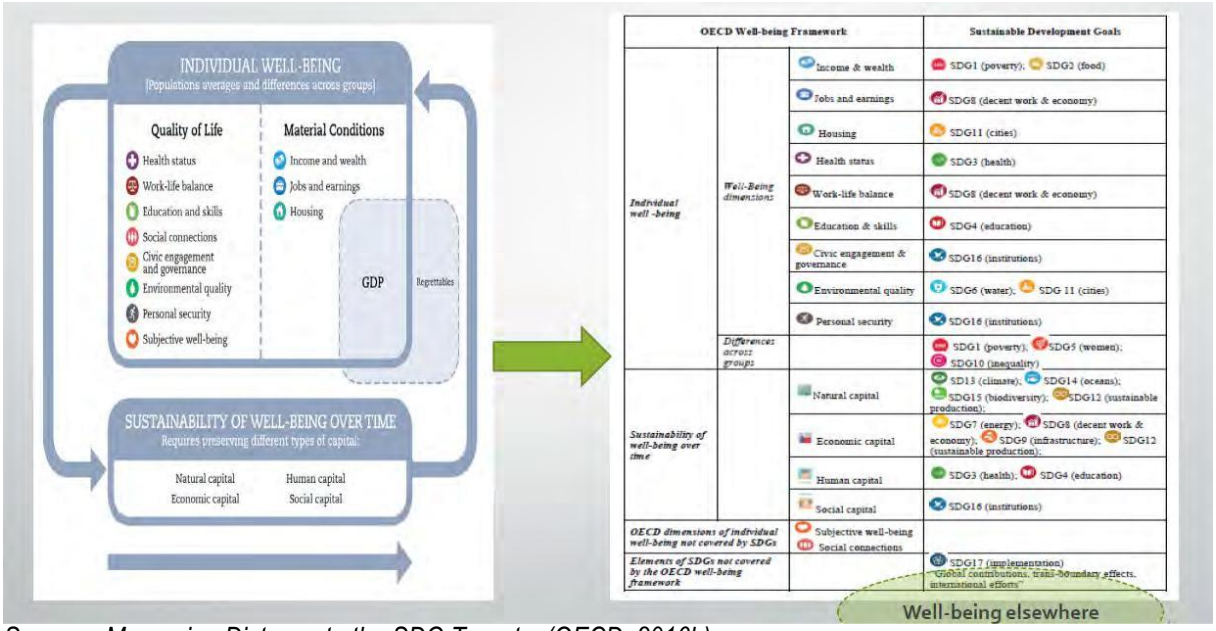
3.1 From GDP and growth to well-being and inclusion

A fundamental and natural starting point to re-think and re-direct a transformation towards a better and sustainable future is to refine *objectives and deliverables of our socioeconomic system*. Underlying the 17 SDGs of Agenda 2030, there is a comprehensive conceptual and policy framework that brings *well-being* and *social inclusion* with *a long-term perspective* and *within the ecological boundaries of the planet* to the heart of future prosperity and sustainability.

The OECD has successfully introduced an indicator system for well-being in the past years. It provides OECD member states with a hands-on policy framework to look "beyond GDP" for an integrated and long-term economic policy, i.e. *a green and inclusive growth strategy*. As shown in Figure 3 below, the well-being framework is closely linked and matched with 17 SDGs. The only major difference/discrepancy between these two systems is the global

dimension of SDGs (well-being elsewhere). The well-being framework is on the other hand, constrained to measure growth performance and life quality on a national/local basis.[4]

Figure 3. Well-being and Agenda 2030 – conceptual framework and linkages



Sources: Measuring Distance to the SDG Targets: (OECD, 2016b)

The 17 SDGs are often, by mistake or in a largely unreflective way, considered as a "check list" in policy-making related to sustainable development. In contrast, the conceptual linkage between the well-being framework and the SDGs sheds important lights on a more system-oriented understanding of SDGs as well as the transformative forces underneath such a system-oriented approach, such as:

- The *multidimensionality of individual well-being*, which systematically links serval SDGs together through an integrated lens of the economic, social and ecological dimensions.
- The *sustainability of well-being over time* based on *a multifaceted and intertwined capital formation*, i.e. natural, economic, human and social capital, provide a conceptual framework, in which serval SDGs can be integrated as a concrete expression of the sustainability-based capital formation process.

This well-being framework has been adopted by many OECD countries as a new guideline for a more future-oriented economic policy-making and/ or a complementary benchmark for socioeconomic performance.[5] The Swedish government has already picked up 15 indicators

4 For more details, see e.g. "How is life – Measuring well-being" (OECD, 2013) http://www.oecd.org/std/3013071e.pdf and "Measuring Distance to the SDG Targets", pp 4-5 (OECD, 2016b) http://www.oecd.org/std/OECD-Measuring-Distance-to-SDG-Targets.pdf

5 For more details, see e.g. "How is life – Measuring well-being" (OECD, 2015b)

from the well-being framework as new measures of prosperity (nya mått på välstånd) and presented them in the spring 2017 Budget Bill (See Table 2 below).[6]

Table 2: New measures for prosperity (nya mått på välstånd) in the spring 2017 Budget Bill

Economic Headline Indicators	Environmental Headline Indicators	Social Headline Indicators
• GDP per capita • Employment rate • Unemployment rate • Household debts • Public debts	• Air quality • Water quality • Protected nature • Chemical pollution • Greenhouse gas emission	• Low-level living standard • Self-assessed health status • Education level • Interpersonal trust • Life satisfaction

Source: The spring 2017 Budget Bill, the Swedish government offices.

These new measures of prosperity provide concrete expressions for what social, economic and ecological sustainability means in the practical policy-making. This is also a starting point to introduce a beyond-GDP-perspective as well as to explore an Agenda 2030-oriented approach in the public administration and improvement of its performance. Both the underlying conceptual framework as well as the application of this framework to the policy-making and decision-making processes will and should have important implications for the future innovation policy. For instance:

- The system approach embedded in the multidimensional performance measures, which in turn needs also to be reflected in the performance of innovation investments and innovation systems.

- The comprehensive and multidimensional definition of capital formation implies a great potential to both broaden and deepen our perspective on sources of innovation as well as on capacity development of innovation systems.

- The linkages between these two frameworks provide a useful bridge to align prosperity and sustainability, which in turn creates a comprehensive "sustainability-driven" innovation policy framework.

3.2 Institutional set-up and governance for a sustainable future? – Strategic, coherent and transformation-oriented /agile

Moving forward from a planning to a more actions -oriented phase, it is becoming increasingly clear that Agenda 2030 implementation is indeed a *strategic governance issue* and calls for *agile leadership. Institutional fitness and readiness for purpose* thus becomes a key success factor as well as a major implemental challenge.

[6] For more details (in Swedish), see e.g. "Nya mått på välstånd", http://www.regeringen.se/49e190/contentassets/bc6dca5172b94ff398a97dfd58dfaa0f/presentationsbilder-nya-matt-pa-valstand.pdf

Having *institutional arrangement* as focus, the UN Department of Economic and Social Affairs (DESA) made a first stock-taking among 22 countries worldwide (both developed and developing countries) who have submitted a voluntary country review of their national implementation of Agenda 2030 to the UN High Level Political Forum (HLFP) on Sustainable Development in 2016.[7] The conclusions from this pilot review highlight the role of governments and public institutions, which "*has never been more critical*" for an efficient implementation of Agenda 2030 and the transformation towards a sustainable future. Despite country-specific contexts and different circumstances for the implementation process, the key observation/conclusion from the Review is that, Agenda 2030 "*calls for governments to transform themselves and deeply change the way they are organized, work, make and deliver policies and relate to people."* In other words, Agenda 2030 implementation needs to start with a re-organization or transformation of the institutional framework, which is partially or gradually taking placing in some countries according to the Review. Faced by this common and daunting challenge, the key action point is to engage and prepare public institutions and administrations for a transformation-oriented process. Nevertheless, the observation from the Review is that "*there appears to be little evidence that public servants are being mobilized and equipped to implement the SDGs".*

Departing from this very first empirical observation, it is already clear that the current institutional set-up and policy processes are not capable of efficiently addressing the complexity and systemic changes embedded in Agenda 2030. This problem is addressed in a recent study by the OECD (2017a), which points to the need for but also the difficulties with "systems approaches to public sector challenges". It argues that the public sector, in its current form in most countries, is ill equipped to tackle the complex policy challenges or so-called 'wicked problems' that characterize our society and world today. Thus, we are faced with a 'governance crisis', caused by the fact that we are using "19th Century institutions" to tackle "21st Century problems" (p.10; for an analysis of this challenge in a national context see also OECD 2017 b, chapter 5).

The institutional readiness for tackling complex challenges as well as exploring new opportunities is still in its infant stage. While many governments and public actors have both a clear awareness and high ambition in this aspect, the reality is that the transformation will most likely be taking place in highly rigid settings and "locked-in" environments. Furthermore, there is highly limited room for reflexivity, experimentation and iterative loops that are necessary for transformative change in the policy-making and reform processes, not to mention that processes are very slow and often delayed for delivering timely and relevant analytical inputs and policy recommendations. Faced by the dilemma of a "gradualism/incrementalism of more of the same

7 The 22 countries included in the first survey/review by DESA are: China, Colombia, Egypt, Estonia, Finland, France, Georgia, Germany, Madagascar, Mexico, Montenegro, Morocco, Norway, the Philippines, the Republic of Korea, Samoa, Sierra Leone, Switzerland, Togo, Turkey, Uganda, and Venezuela. The review will be further expanded by including another 44 countries who submitted their voluntary reporting to the HLFP in July, 2017. For more information, see e.g. "*Compendium of National Institutional Arrangements for implementing the 2030 Agenda for Sustainable Development - Pilot version based on the 22 countries that reported on national implementation at the 2016 HLPF*", (UN DESA, 2016).
http://workspace.unpan.org/sites/Internet/Documents/UNPAN97468.pdf

and more of good practice" and a transformation-minded approach for more radical changes, the fundamental question is what role the government and public sector need and should play? The answer should be straightforward and obvious: we need not only transformative changes, but also accelerated transformative changes - if we are taking the depth, the magnitude and the urgency of the societal and ecological challenges that we are facing seriously. As a senior civil servant put it sometime ago[8] "*the real issue is not the efficiency of government but what government contributes to the adaptive efficiency of the country*…". In the context of Agenda 2030, it goes beyond "adaptive efficiency". Instead, it is about transformative capability and efficiency. Agenda 2030 is a universal and readily negotiated government/policy programme for transformative capacity building and transformative changes, which needs to be translated and materialised into concrete actions and accountable deliverables through *vision* and *leadership*.

Being pushed out of the "comfort zone", consciously or unconsciously, the initial planning and implementation of Agenda 2030 has already contributed to bring some previously unarticulated and "hidden" structural and institutional issues/questions to the surface within the governments and public agencies. For instance:

- The silo-based structure that has been designed for single dimensional objectives and "zero-sum" resource allocation/competition is simply not fit for the purpose, i.e. the multidimensional and system-oriented nature of a comprehensive and transformative policy agenda, such as Agenda 2030. The question is who will start and how to deal with this "heavy-lifting" – which involves deep-seated inertia and does not (necessarily) give short-term political and career-wise quick-wins.

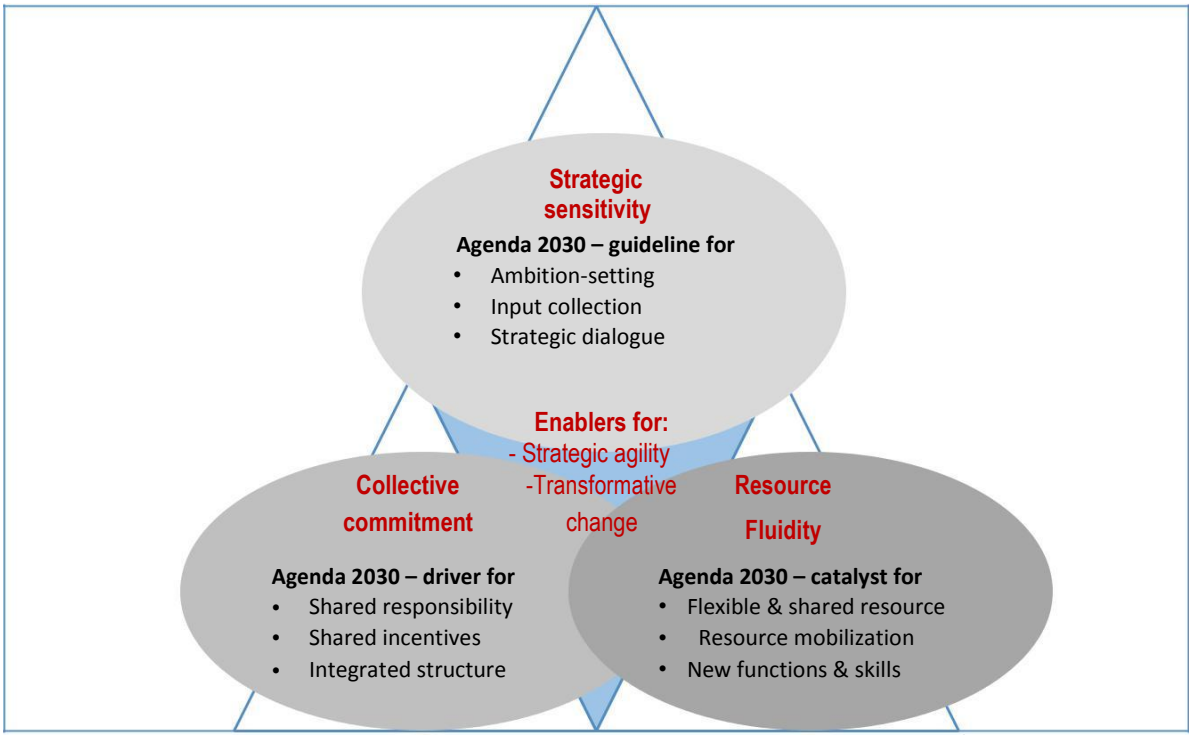
- The design and development of implementation mechanisms and processes will be a learning-by-doing exercise, through which improvement of the current system as well as creation of new supporting and engaging mechanisms will be critical. The question is how to create experimental spaces to support public sector innovation and capacity building? How to organise and implement such "learning-processes for transformative changes" in the practical policy- and decision process, continuously, reflexively and inclusively?

- Many countries, particularly countries like Sweden have both a long tradition and impressive track-record when it comes to policy-making on sustainable development. Looking ahead, the future sustainability and related policy-making processes will need to be innovation-driven and transformation-driven, which requires system knowledge, strategic development capacity and not least entrepreneurial skills, i.e. an entrepreneurial state needs policy entrepreneurs. The question is if such transformation-minded skill-, competence- and capacity development is actually taking place in the government and public sectors.

[8] Comment made at the workshop of the Small Advanced Economies initiative, Copenhagen, November 12, 2013, by Peter Ho, a long serving Head of the Civil Service of Singapore.

The bottom-line is that, to make the implementation of Agenda 2030 a truly transformative process, the reform and innovation of the institutional structure and governance practices per se will need to be key drivers of transformative changes. In other words, transformation-oriented and transformation-capable governments and public agencies need to be/become a strategic catalyst for transformative changes both within the public sector and beyond. In this context, *reflexive governance*, *experimental space and learning practices* for policy-learning and making – but most of all, *a transformation-minded political leadership and institutional culture* – will be more important than ever. There is, so far, no ready-made governance model for transformative changes. But Doz and Kosonen (2014) provides a useful starting point to understand the most essential building blocks/enablers for a strategic and transformation-oriented governance model (See Figure 4 below). It is also interesting to note that, while the study considers Sweden a good example of developing various enablers of strategic agility in its governance practice, experimental policy-making has not been widely used in Sweden (pp 16).

Figure 4. Enablers for strategic agility and transformative change with Agenda 2030



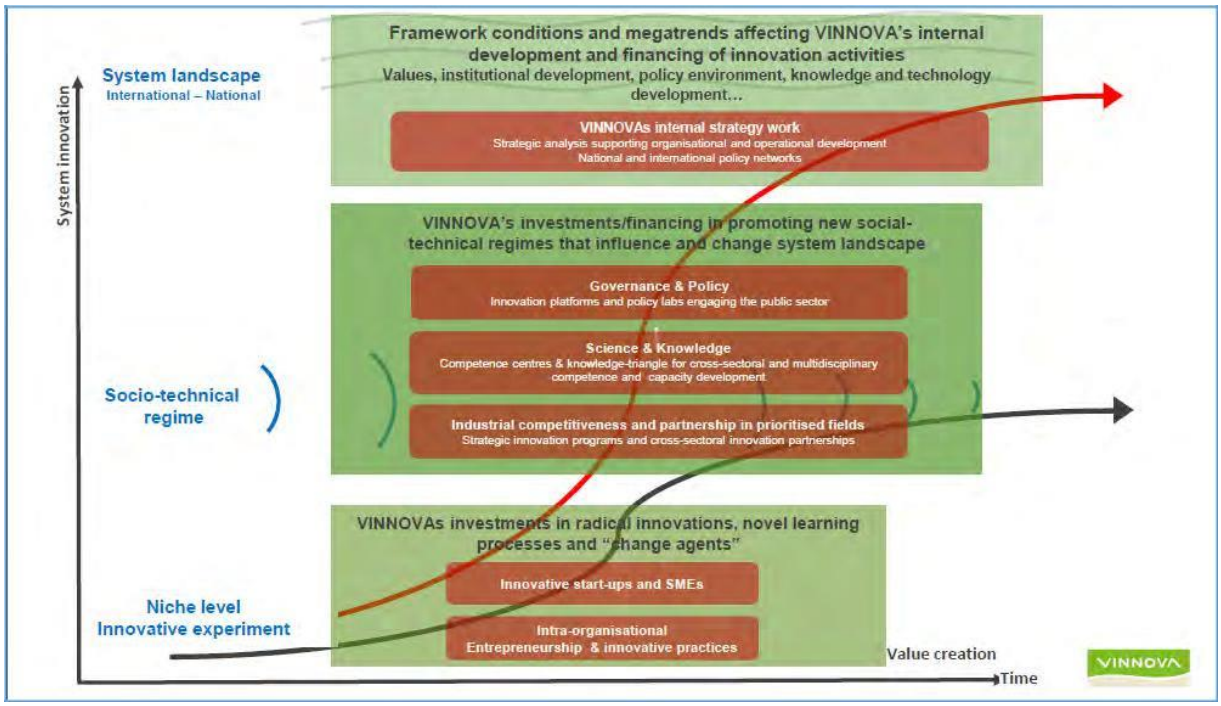
Sources: This figure is adopted and modified based on the figure from Governments for the Future: Building the strategic and Agile state (Doz and Kosonen, 2014, pp11)

4. The Agenda 2030 integration and sustainability-driven system innovation- The case study of Sweden

4.1 System innovation – from theory to practice

Sweden's Innovation Agency, VINNOVA, is a governmental agency under the Ministry of Enterprise. It has been actively engaged in theoretical and policy development related to system innovation, for instance through its support and active participation in the OECD-project on system innovation. Departing from the strategic insights gained from the analytical and policy work, VINNOVA has taken a step forward and is in the process of implementing the system innovation approach to enhancing its organisational and operational performance (see Figure 5 below).

Figure 5. System innovation and VINNOVA



This system-based approach focuses on aligning a strategic understanding of various changes in the system landscape with actions to stimulate changes in the established social-technical regimes and to encourage radical innovations and innovative experiments at the niche level. The alignment creates an important organisational and operational basis for facilitating and driving transformative changes, not least in the context of implementation of Agenda 2030.

4.2 Challenge-driven innovation – an experiment in innovation policy with directionality

Directionality related to societal challenges is the key element of a transformative innovation policy and in this context, VINNOVA has also been a "first-mover". The Challenge-Driven Innovation (CDI) program was launched by VINNOVA in 2011 to address societal challenges related to *future healthcare*, *competitive industries* , *sustainable attractive cities*, and *information society*. The program aims to tackle societal challenges through enhanced capacity and strengthened international competitiveness of Sweden's innovation system for creating and

delivering sustainable solutions.[9] CDI can be considered a concrete application, or a learning-by-doing experiment for achieving transformative change. The transformative ambition is clearly expressed in VINNOVA's description of its CDI Program as "*visionary, challenge existing mental models and target systemic issues. These issues are characterised by a transnational character that requires a multidisciplinary approach"* (VINNOVA, 2016. p.3). One of key system-changing focuses of the CDI program is the *development of innovation capacity and innovation processes in the public sector*. A system-oriented and partnership-based approach can be a strategic and effective tool to both improve the quality and efficiency of public service provision as well as to transform welfare challenges to growth opportunities. From an operational viewpoint, CDI is designed to be learning-by-doing exercises to address *bottlenecks* and *missing pieces* for innovation development in a *broader institutional environment and targeting an integrated policy mix.* The underlying objective/rationale of CDI is particularly related to *structures*, *capacities* and *incentives* that are necessary for the emergence of new constellations and ecosystems to create an innovation-oriented mind-set and actions for transformative changes, not least in the public sector. From the on-going implementation, some strategic strengths of CDI programs can already be observed. For instance:

- **Openness and reflexivity**: The CDI program involves a broad range of stakeholders in a structured process organized by VINNOVA to formulate priority areas. For instance, more than 100 research and innovation organizations were involved in the open consultation process to identify priority areas of CDI.

- **Demand-driven focus**: The CDI program has a strong focus on involving 'problem owners' and other users or relevant stakeholders – such as municipalities, patient organizations, healthcare providers etc. – as active partners in the implementation process.

- **Cross-sectoral policy collaboration**: Given the cross-sectoral and the policy-driven nature of the CDI-programs, the *collaboration among public agencies in different policy fields* is equally important as the cross-sectoral collaboration among actors from the private sector. Nevertheless, such cross-sectoral collaboration among public agencies is, for many reasons, too rare and limited in practice. In such a context, CDI has made some promising progress to establish some successful cases, through which valuable operational insights can be gained for the future.

At the same time, some operational limitations and challenges are also emerging, such as:

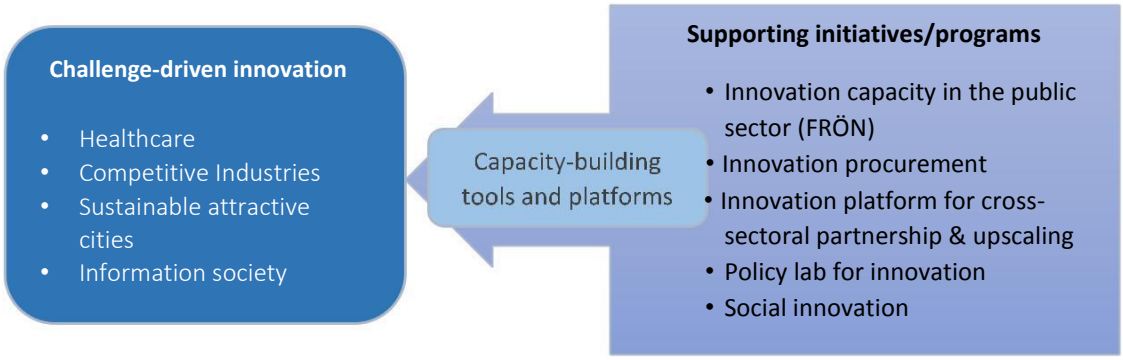
[9] For more detailed information and analysis on CDI, see e.g. "Towards next generation PPP models – insights from an agency perspective" (Schwaag Serger and Palmberg 2017) and "Förutsättningar för innovationspolitik I Sverige" (VINNOVA, 2015, in Swedish).

- **Market-creating or transforming elements:** The market-creating or transforming elements – such as public procurement or other forms of market entry/development – are not very pronounced in the examined programs. Despite the observed innovation strengths and market potential, there is no systemic mechanism for upscaling successful solutions e.g. in goods and services offered by or provided to the public sectors in the domestic and global markets in a longer perspective. This can be partly explained by the fact that they are beyond the remit of the agencies running the programs (Palmberg and Schwaag Serger, 2017) as well as the early development and implementation stage of programs.

- **Experimenting components.** Experimentation has not been a prominent component in these programs in the current stage. But a key observation during the implementation process is that there is a clear need for developing knowledge, skill and capacity for experimentation exercises. This is particularly true when engaging actors from the public sector and the civil society, who have not yet identified themselves as "innovators". To address this capacity issue, complementary and supportive initiatives have been created in parallel by VINNOVA, during the implementation of CDI to encourage and build up the capacity for experimentation (See Figure 6 below).

- **International linkages**: So, far the CDI program has had a strong focus on *national collaborations or partnership*, neglecting or perhaps even introducing a bias against *international linkages* (Schwaag Serger and Palmberg 2017).

Figure 6: CDI and supporting initiative for capacity-building



4.3 From CDI towards Agenda 2030-inspried and integrated innovation programs

CDI has undoubtedly laid a valuable conceptual ground and provided substantive empirical insights for an enhanced innovation policy to tackle societal challenges. Given both the strategic importance of innovation and partnership development for Sweden's Agenda 2030 implementation, there is a great potential that programs like CDI become both an inspiration and a concrete policy tool for a truly transformation-oriented Agenda 2030 implementation. Bringing the experiences and insights from CDI as well as the integrated policy framework of

Agenda 2030 together, Agenda 2030 can contribute to and integrate with a new framing of a system-oriented innovation policy in some strategic and operational aspects:

- Agenda 2030 requires a "whole-of-government" approach to policy coherence and policy innovation for sustainability transition. This is a fundamental starting point to introduce *the comprehensive and integrated institutional framework and policy environment* as a necessary condition for developing system innovation. At the same time the interest in, and the need for policy processes and governance tools for system innovation development are becoming more apparent and urgent than ever. This can create a strong awareness and incentive for engaging the public sector, not only as a user of innovation, but as a driver for and partner in the innovation process (See Figure 7 below).

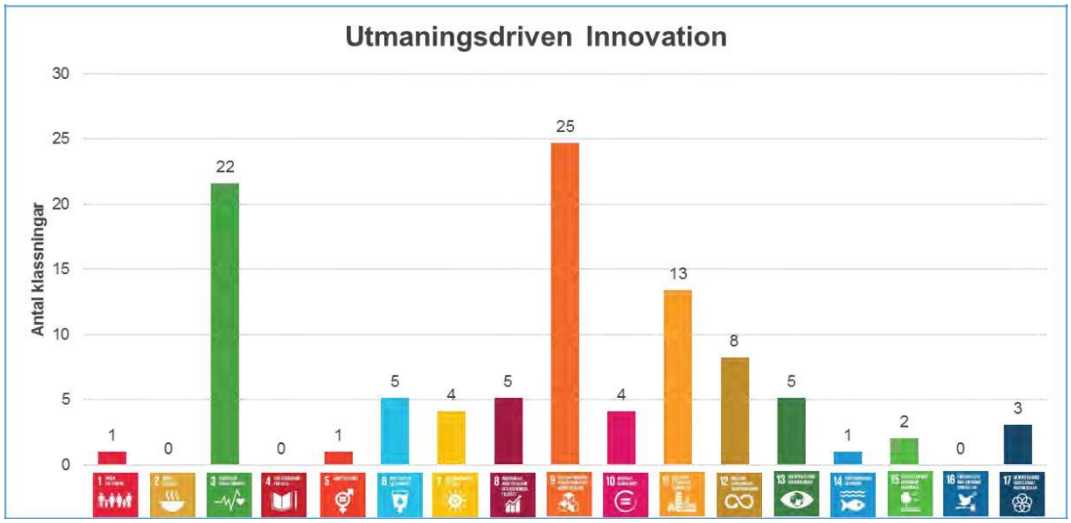
Figure 7. Agenda 2030 – A new framework for innovation and partnership & the role of the public sector

- Mission-driven and challenge-driven innovation programs have made promising progress to address societal challenges, particularly through a bottom-up approach. *Alignment/combination of the bottom-up approach* with Agenda 2030 and SDGs, as *a "top-down" directional and strategic policy initiative* can be a powerful and dynamic process to bring about radical transformation – with scale and speed. At the same time, such a combination may also create a viable route towards a global innovation system for global challenges - when the "universality" of Agenda 2030 is brought into an innovation context (See Figure 8 below).

Figure 8. Agenda 2030 and challenge/mission innovation

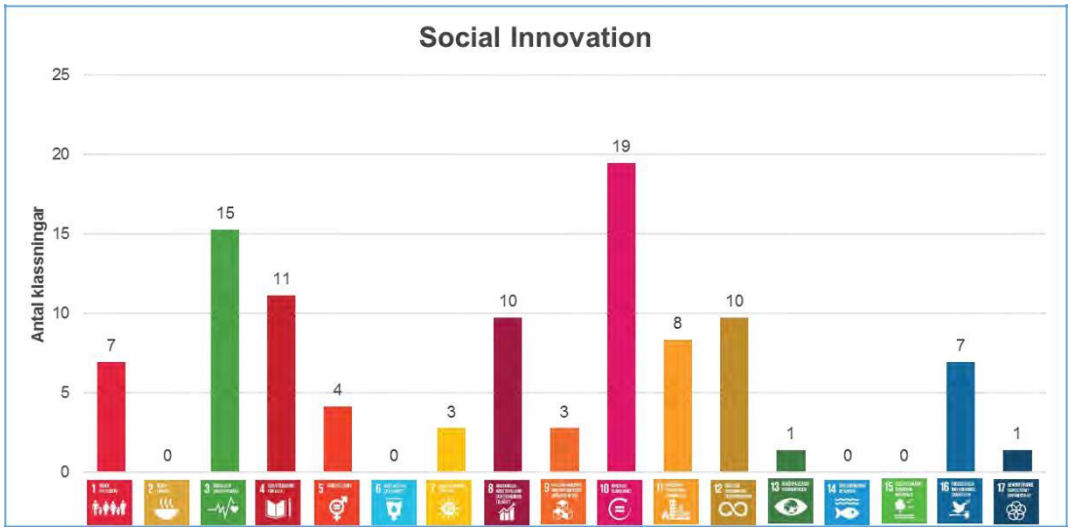
- An integrated view on how the 17 SDGs and associated targets are related to and interact with each other shed new lights on how "societal challenges" need to be defined and addressed, i.e. based on *a deeper understanding of and a more systemic/coherent approach* to achieving sustainability. This integrated view on sustainability involves both a forward-looking scientific basis and transformative forces from the market, the business sector and the society. Therefore, transition dynamics towards sustainability in the form of new ideas and knowledge, new business and investments can be new drivers for Sweden's competitiveness and future prosperity. In other words, an integrated and transformation-oriented understanding of sustainability per se, implies potentials that may break up "path-dependency" in some short-term oriented objectives of innovation policy as well as /the "lock-in" of contents and constellations in innovation programs. Having the CDI program as a departing point, a pilot mapping of VINNOVA's CDI project portfolio with the SDGs has been carried out (See Figure 9 below). 42 CDI project owners were asked to classify their projects according to the contribution to various SDGs of Agenda 2030. The results show that there are already clear links between the CDI-program and Agenda 2030, particularly in the fields of health (SDG 3) and industries, infrastructure and cities (SDG 9 and SDG 11). At the same time, there is a great potential to develop an Agenda-2030 inspired CDI-program in the future, supported by a more integrated and system-oriented approach to identifying societal challenges. This implies that the 17 SDGs represent not only 17 individual societal challenges. Instead, there are underlying transformative dynamics, which require a deeper understanding of, and a system-oriented view on, societal challenges, i.e. how the various SDGs are inter-connected and related to each other.

Figure 9. Challenge-driven innovation and Agenda 2030



Taking VINNOVA's "social innovation" program as another example (See Figure 10 below), the 29 project owners of VINNOVA-financed projects were asked to indicate which SDGs their projects are contributing to. This preliminary mapping provides a much broader picture of how social innovation is contributing to sustainable development beyond "social issues" only. Among these 29 projects, most of them already have an integrated approach, with their objective covering multiple SDGs.

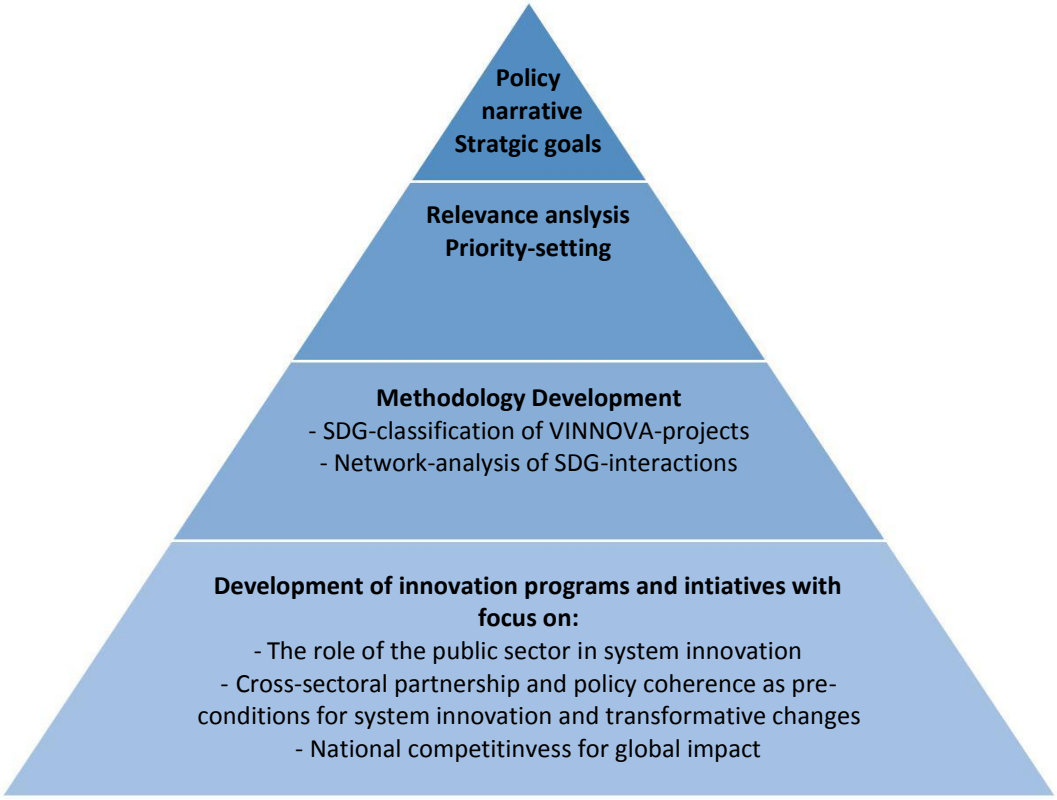
Figure 10. social innovation and Agenda 2030



4.4 Some preliminary insights from on-going Agenda 2030 integration at VINNOVA

Having the above observations and insights in mind, VINNOVA has already started its initial Agenda 2030 integration process, including four main steps, as illustrated in Figure 11 below.

Figure 11. VINNOVA Agenda 2030-integration pyramid



As a strategic and steering starting point, the first step is to formulate a policy narrative that clearly motivates why Agenda 2030 is of strategic importance for VINNOVA, i.e. **a narrative of how innovation and innovation policy contribute to sustainable development**. This in turn provides the rationale and framework for setting VINNOVA's strategic goals for its internal development. Using Agenda 2030 and SDGs as strategic tools to work with VINNOVAs project portfolio and develop Sweden's innovation system and innovation policy have already become one of VINNOVAs internal goals.

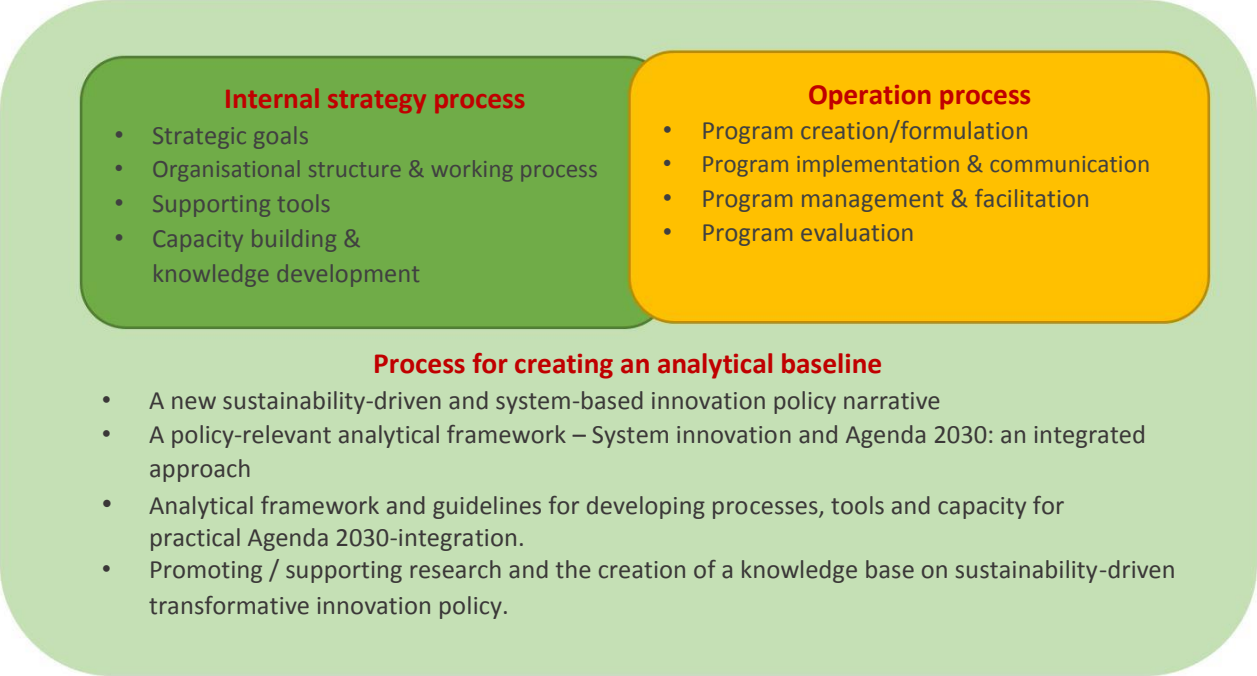
As the next step, **a relevance analysis** has been carried out, i.e. **"translate"/create an interpretive framework of Agenda 2030** from a VINNOVA-perspective. This creates a basis of priority-setting for strengthening the existing programs and initiatives as well as for identifying the needs of developing new ideas and programs.

To obtain a quantitative and qualitative overview of how VINNOVA's previous and ongoing innovation programs are already related/ contribute to different SDGs, a stock-taking of VINNOVA's total project portfolio in the form of **a classification and mapping exercise** is being carried out. This exercise has turned out to be a highly demanding process, which requires both a solid and updated understanding of the current research- and policy frontiers in the field of sustainable development on the one hand and deep insights in the Swedish and the global innovation landscapes and policy developments on the other.

Supported by the above strategic, analytical and methodological preparation, the future Agenda 2030-integration will be aiming at the **further development of VINNOVA's programs and**

initiatives. In this process, the most strategic components of system innovation will be the focus, i.e. making the implementation of Agenda 2030 a process of a truly strategic lift of innovation policy and innovation investments, towards a system-approach for transformative changes. At the operational level, three integrated and interactive processes are already initiated to operationalize the Agenda 2030- integration, which can be illustrated in Figure 12 below:

Figure 12. VINNOVA Agenda 2030-integration key processes



5. Concluding discussions

5.1. Agenda 2030 and system innovation – the key insights from the Swedish case

Even though the Agenda 2030-integration process at VINNOVA is still in an early stage, some important results and challenges ahead are already apparent, which are not necessarily VINNNOVA-specific, but of a more generic nature and thus can be relevant to the innovation policy community and many other policy fields in a broader context. For instance:

- A system approach has been discussed for a long time in the innovation policy and the transition study communities. But in reality, **a broad and structured policy context/environment** is often missing for moving beyond the conventional project- and program-based approach towards a system-innovation approach. In this context, Agenda 2030 provides a necessary and valuable policy framework for such a structural and strategic shift.

- To implement Agenda 2030 is not only about policy development at the conceptual and analytical level. It truly touches on **structural and organizational changes** that need to be based on a solid understanding of both the research and policy frontiers of sustainability and the role of innovation and innovation policy to achieve it. When integrating Agenda 2030 at VINNOVA, it is already apparent that both the scope and the depth of this process will affect how VINNOVA will be organised and operate as well as how VINNOVA will need to interact with other actors, both in the public sector and beyond, in the future.

- It is also important to underline that Agenda 2030-integration does not imply starting from scratch. Instead, it involves two parallel processes, namely 1) **integrating Agenda 2030 with existing progresses, programs and instruments** while at the same time identifying and developing quality improvement and added-value through the Agenda 2030-integration. The on-going work with the CDI-program at VINNOVA is a good example of 2) **a more explorative and experimental approach with a particular focus on the "transformative" potential of Agenda 2030.** This involves more conscious efforts to deviate from "business-as-usual" and path dependency – through which what "transformative changes" are and how to achieve them can be more explicitly defined and concretely demonstrated.

- Moving towards such a system approach requires deepened interactions and collaboration between innovation policy and other policy fields that are central for implementation of Agenda 2030. However, both **awareness** of and **institutional readiness** for creating such an integrated and coherent approach to system innovation for Agenda 2030 are still limited or pre-mature, at least in the Swedish context.

- To a large extent, the emphasis on "directionality" of innovation policy points out the strategic importance as well as the transformative potential of **combining the "top-down" policy initiative with bottom-up innovation practices and activities**. However, to make such a combination meaningful and effective turns out to be highly complex and involves extensive knowledge and capacity issues in many policy fields, including innovation policy. Given the long and strong tradition of the bottom-up approach and practices, not least when it comes to innovation system development, there are still limited understanding of and significant mental/cultural barriers to such a combined/synchronized approach. It is often an ignored fact that many of the societal challenges included in Agenda 2030 need to be tackled, not only with directionality, but also a time-limit. In this context, **novelty**, **scale** and **speed** are simultaneously three key parameters, generating transformative changes.

- While VINNOVA has been successful in implementing challenge-driven innovation programs, the **global dimension** as well as **scaling-up** are still key challenges. In the process of Agenda 2030 implementation, how to overcome the "good-example trap" and

make the national implementation of Agenda 2030 a part of global transformation process is more important than even – if this strategic opportunity is to be fully materialised.

- VINNOVA's work with Agenda 2030 is in many ways an example of **bottom-up innovation and policy experimentation**. Thus, it was not result of a clear top-down instruction or directive from government. Rather, it could be argued that it was the agency's self-initiated response to the government's declaration of its ambition that Sweden should be one of the world leaders in the implementation of Agenda 2030 combined with the realization of the potential complementarity and compatibility of linking Agenda 2030 to innovation policy and programs. This type of behavior is not unusual for Swedish government agencies and is made possible by the fact that agencies are given quite large freedom to design programs and initiatives. This does not mean that agencies can (or should) do what they want or that they operate in a political vacuum. Rather, successful initiatives are often based on agencies responding to political signals (and declarations of political priorities) by finding efficient, creative and ambitious ways of translating political priorities into concrete initiatives, based on their expertise of designing and running programs and the close interaction with stakeholders. Conversely, the ability of agencies to create and implement effective programs and initiatives can be hampered when the political signals and priorities are unclear or fickle.[10] On a more general note, the implementation of Agenda 2030 and of a transformative innovation policy raises **important questions with regard to policy governance, principal-agent issues and combining bottom-up and top-down efforts within the public sphere**.

5.2. A system innovation driven implementation of Agenda 2030 – a few insights on the way forward

Our paper has sought to establish a conceptual link between an increasingly transformation-oriented innovation policy with clear elements of directionality, on the one hand, and Agenda 2030 as a transformative policy agenda for sustainability-driven growth and competitiveness, on the other hand. It has shown the *transformative potentials* that can be achieved by, as well as argued the necessity of, integrating these two frameworks both from a theoretical and a policy perspective. It also reveals an unexpected and hitherto ill-understood disruptive nature of Agenda 2030 as a policy initiative, by requiring far-reaching changes in the *mind-set, institutional set-up* and *governance practices* that so far have been main barriers to transformation towards sustainability. This redefines the role of the public sector in promoting and driving a sustainable development and growth agenda – centering on innovation, in the business sector, the civil society and the public sector as one of the key strategic policy tools.

Examining the efforts of Sweden's innovation agency to implement Agenda 2030 and to reorient fundamentally its operations towards an Agenda 2030 framework reveals both the interlinkages between these two approaches but also the considerable challenges in trying to

[10] The appropriate level of granularity political signals (i.e. how specific should they be in order to allow both clarity and leeway) is an important related question, which however is highly context-dependent and exceeds the scope of this analysis.

integrate them. The challenges include a new framing of policy narrative on innovation and sustainable development and growth as well as the need for designing new instruments and processes for promoting transformative innovation targeting societal challenges. There are also wider governance challenges particularly related to the need for integrating policy areas and tools (including greater resource fluidity), for promoting experimentation, learning and risk-taking in the public sector. At the same time, these challenges can also be a strategic opportunity for reframing innovation policy as well as redefining the institutional "positioning" of innovation policy – beyond a narrow sectoral, business and growth perspective towards *a horizontal and more inclusive and strategic "policy mix" for system innovation and transformative change*.

Agenda 2030 presents a historic opportunity and pressure to drive *institutional renewal* and *policy-making and implementation for change* – which could arguably be the most ground-breaking transformative forces of Agenda 2030. But policymakers must be prepared to meet and overcome significant resistance (e.g. from various incumbents), institutional rigidities and regulatory obstacles. At the operational level, the shortfall of competence and capacity for implementing a challenge-driven and sustainability driven policy agenda of an integrated and transformative nature, such as Agenda 2030, are also increasingly apparent. In such a context, innovation and innovation policy play a key role in driving these change processes as well as in building the necessary capacity and readiness for delivering the changes. Thus, Agenda 2030 and a system-oriented innovation policy, particularly any innovation policy with transformative ambitions, are mutually dependent and interrelated and will have to co-evolve together.

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