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FEDERAL MINISTRY OF EDUCATION, SCIENCE AND RESEARCH

Minoritenplatz 5, 1014 Vienna

Mag.ª Irene Danler
E: irene.danler@bmbwf.gv.at

Mag.ª Simone Mesner
E: simone.mesner@bmbwf.gv.at

FEDERAL MINISTRY FOR DIGITAL AND ECONOMIC AFFAIRS

Stubenring 1, 1014 Vienna

Mag.ª Sabine Pohoryles-Drexel
E: sabine.pohoryles-drexel@ bmdw.gv.at

FEDERAL MINISTRY FOR CLIMATE ACTION, ENVIRONMENT, ENERGY, MOBILITY, INNOVATION AND TECHNOLOGY

Radetzkystraße 2, 1030 Vienna

Dr. Rupert Pichler
E: rupert.pichler@bmk.gv.at

MSc (WU) Philipp Witibschlager, BA
E: philipp.witibschlager@bmk.gv.at

ACR – AUSTRIAN COOPERATIVE RESEARCH

Sensengasse 1, 1010 Vienna

Dr.in Sonja Sheikh
E: sheikh@acr.ac.at

AUSTRIAN COUNCIL FOR RESEARCH AND TECHNOLOGY DEVELOPMENT

Pestalozzigasse 4/DG 1, 1010 Vienna

Dr. Johannes Gadner
E: j.gadner@rat-fte.at

AIT – AUSTRIAN INSTITUTE OF TECHNOLOGY

Giefinggasse 4, 1210 Vienna

Mag. Michael Dinges
E: michael.dinges@ait.ac.at

Mag.ª Barbara Heller-Schuh, MAS
E: barbara.heller-schuh@ait.ac.at

AQ AUSTRIA – AGENCY FOR QUALITY ASSURANCE AND ACCREDITATION AUSTRIA

Franz-Klein-Gasse 5, 1190 Vienna

Dr.in Elisabeth Froschauer-Neuhauser
E: elisabeth.froschauer-neuhauser@aq.ac.at

Dr.in Eva Maria Freiberger
E: eva.maria.freiberger@aq.ac.at

AWS – AUSTRIA WIRTSCHAFTSSERVICE GMBH

Walcherstraße 11A, 1020 Vienna

Dr.in Elvira Welzig
E: e.welzig@aws.at

Mag. Norbert Knoll
E: n.knoll@awsg.at

CDG – CHRISTIAN DOPPLER RESEARCH ASSOCIATION

Boltzmanngasse 20, 1090 Vienna

DIin Magª. Brigitte Müller
E: brigitte.mueller@cdg.ac.at

CONVELOP – COOPERATIVE KNOWLEDGE DESIGN GMBH

Bürgergasse 8-10/I, 8010 Graz

DIin Drin. Karin Grasenick
E: karin.grasenick@convelop.at

Erdbergstraße 82/4, 1030 Wien

Mag. Thomas Jud
E: thomas.jud@convelop.at

FFG – AUSTRIAN RESEARCH PROMOTION AGENCY

Haus der Forschung,
Sensengasse 1, 1090 Vienna

DIin Dr.in Sabine Mayer
E: sabine.mayer@ffg.at

Mag. Leonhard Jörg
E: leonhard.joerg@ffg.at

FWF – AUSTRIAN SCIENCE FUND

Haus der Forschung
Sensengasse 1, 1090 Vienna

Dr. Falk Reckling
E: falk.reckling@fwf.ac.at

Dr.in Elisabeth Nindl
E: elisabeth.nindl@fwf.ac.at

IHS – INSTITUTE FOR ADVANCED STUDIES

Josefstädter Straße 39, 1080 Vienna

Dr.in Angela Wroblewski
E: wroblews@ihs.ac.at

INDUSTRIEWISSENSCHAFTLICHES INSTITUT – IWI

Mittersteig 10, 1050 Wien

FH-Hon.Prof. Dr. Dr. Herwig W. Schneider
E: schneider@iwi.ac.at

Mag. Philipp Brunner
E: brunner@iwi.ac.at

JOANNEUM RESEARCH FORSCHUNGSGESELLSCHAFT MBH

Haus der Forschung
Sensengasse 1, 1090 Vienna

Mag. Wolfgang Polt
E: wolfgang.polt@joanneum.at

Mag. Jürgen Streicher
E: juergen.streicher@joanneum.at

KMU FORSCHUNG AUSTRIA – AUSTRIAN INSTITUTE FOR SME RESEARCH

Gusshausstraße 8, 1040 Vienna

Mag. Peter Kaufmann
E: p.kaufmann@kmuforschung.ac.at

LUDWIG BOLTZMANN GESELLSCHAFT

Nußdorfer Straße 64, 1090 Vienna

Mag. Patrick Lehner
E: patrick.lehner@lbg.ac.at

OEAW – AUSTRIAN ACADEMY OF SCIENCE

Dr. Ignaz Seipel-Platz 2, 1010 Vienna

Nikolaus Göth, MSc
E: nikolaus.goeth@oeaw.ac.at

TECHNOLPOLIS GROUP AUSTRIA

Rudolfsplatz 12/11, 1010 Vienna

Mag.ª Katharina Warta
E: warta@technopolis-group.com

Tobias Dudenbostel, MA
E: tobias.dudenbostel@technopolis-group.com

VIENNA BUSINESS AGENCY. A SERVICE OFFERED BY THE CITY OF VIENNA.

Mariahilfer Straße 20, 1070 Vienna

Robert Mayer-Unterholzer
E: mayer-unterholzner@wirtschaftsagentur.at

DI Mag. Alfried Braumann
E: braumann@wirtschaftsagentur.at

WIFO – AUSTRIAN INSTITUTE OF ECONOMIC RESEARCH

Arsenal, Objekt 20
Postfach 91, 1103 Vienna

Dr. Jürgen Janger
E: juergen.janger@wifo.ac.at

Dr. Andreas Reinstaller
E: andreas.reinstaller@wifo.ac.at

WPZ RESEARCH GMBH

Mariahilfer Straße 115/16, 1060 Vienna

Dr.in Brigitte Ecker
E: brigitte.ecker@wpz-research.com

WWTF – VIENNA SCIENCE AND TECHNOLOGY FUND

Schlickgasse 3/12, 1090 Vienna

Dr. Michael Stampfer
E: michael.stampfer@wwtf.at

Dr. Michael Strassnig
E: michael.strassnig@wwtf.at

ZSI – CENTRE FOR SOCIAL INNOVATION

Linke Wienzeile 246, 1150 Vienna

Dr. Klaus Schuch
E: schuch@zsi.at

Drin Dorothea Sturn
E: sturn@zsi.at

EDITORIAL

DEAR READERS!

Welcome to this new issue of the fteval Journal for Research and Technology Policy Evaluation, which is thematically open and essentially emphasises inputs from practice.

Several contributions reflect the work of the authors "in the field" and share the experiences gained. We have for instance a contribution that presents lessons learned in the evaluation of a transition-oriented funding framework programme, while another contribution reflects on the impact of Austria's Research Financing Act on evaluation.

A special feature of this issue are three articles dealing with the social impact of RTI policy measures. They are the results of working groups initiated by fteval, which in recent months have intensively discussed and elaborated potential impact paths in three thematic areas: the impact of R&I and R&I policy on (i) social innovations, (ii) on sustainable economic activity and (iii) on the relationship between science and society. Consideration was also given to how these areas impact back on R&I policy.

At the end of this issue, we report on the results of the fteval Symposium on internal evaluation, which took place online in November 2020, adding further reflections to the rich discussion.

The upcoming issue #53 is reserved for the proceedings of the REvaluation 2021 Conference, which will take place under the motto "Anticipation - Transformation - Resilience" on 18-19 November in Vienna. You can find more information on the conference website www.revaluation2021.eu.

The issue #54 will again have a thematic focus. The call for this special issue on participatory evaluation and impact assessment in citizen science is already open. As usual, you may find all information on our website www.fteval.at.

We wish you an exciting read and a pleasant summer!

Yours,

Klaus Schuch and Isabella Wagner
for the Journal's Editorial Team

July 2021

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THE RESEARCH FINANCING ACT. A NEW FRAMEWORK FOR PUBLICLY FUNDED RESEARCH IN AUSTRIA AND ITS IMPACT ON EVALUATION

RUPERT PICHLER

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opinion paper

INTRODUCTION

On 7 July 2020, the National Council – the first chamber of the Austrian Parliament – passed a package of legislation introducing a new framework for the methods of allocating federal budgets to research, technology, and innovation (RTI). Its core is the Research Financing Act (RFA), complemented by several amendments to existing laws that are necessary for its implementation. Entry into force was on 25 July 2020, the amendments became effective as of 1 January 2021 (BGBl[1]. I No. 75/2020[2]). The RFA is the biggest legislative project in the field of RTI policy since 2004 when the Research Funding Agency (FFG) was established (Pichler et al. 2007, pp. 329-336; Stampfer et al. 2010, pp. 775-776). For the first time, budget law regulations are now aligned with the needs of institutions performing or funding RTI (Pichler 2021). This article outlines the background and content of the RFA and concludes with a view on the significance of evaluation within the new system.

The RFA adds a crucial element to the legal framework for publicly funded RTI in Austria at federal level. In general terms, this framework rests on three major pillars: organisational law, funding and state aid laws, and budget law. As for the first two pillars, RTI specific regulations already exist. Typically, RTI related organisational law establishes research or research funding institutions, mostly as statutory bodies or as publicly owned companies (Pichler 2017). Funding and European state aid laws determine the conditions under which taxpayers' money may be used to incentivise RTI, resulting in specific RTI funding guidelines. Budget law defines the rules and procedures the government itself has to adhere to when it spends public money and hands it over to its agencies. However, before the new legislation, budget law did not comprise any regulations specific to RTI, which had to play along the general rules instead, often suiting its needs not very well. Yet there are examples in neighbouring policy fields for such specific budgetary rules like those provided by university law. Beyond these three pillars there are, of course, other regulatory matters where RTI is addressed, such as tax and labour laws.

CHALLENGES

Many of the apparent shortcomings within the public RTI system in Austria that have been – not only in recent years – identified can be attributed to the budgetary regulations that were in place until 2020. Among the problems most often referred to were the fragmentation, volatility and short-term nature of financial flows from the government to the various RTI institutions. This was largely owed to general budget law provisions according to which RTI budgets counted as discretionary expenditures (thus potentially threatened by cuts), individual schemes were subject to annual approval by the ministry of finance, limitations to the size of such schemes applied, and possibilities of commitments entailing obligations in future fiscal years remained very restricted.

Therefore, the financing structures of RTI institutions became – for both themselves as well as their principals – increasingly difficult to manage. They featured a broad variety of numbers, dimensions, and periods of financial flows. Each financial commitment came with a separate contract and its own set of rules, not least for evaluation. Come to that, no difference was made between institutions controlled by the federal government in its capacity as supervisory authority or owner and entirely independent institutions eligible for public funding. This meant that unequal subjects were treated equally and hence rules applied that were not equally appropriate.

The complexity of the financing structures combined with the requirements for the programmes and schemes the funds went to resulted in a situation where "[t]here are coordination problems due to an unclear division of labour between agencies and ministries that results in 'under-steering' at the strategic and 'over-steering' at the operational level." (OECD 2018, p. 45; cfr. Bührer et al. 2017, p. 140). Because the ministries had to busy themselves with the administration of dozens of contracts every year, they evidently had little capacity left for strategic oversight and steering. The resulting micromanagement left principals and agents deeply intertwined. Inevitably, the evaluation landscape also reflected this structure: the many small, fragmented programmes were followed

1 Federal Law Gazette.

2 Forschungsfinanzierungsnovelle 2020 including Forschungsfinanzierungsgesetz (FoFinaG): https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=20011237, last retrieved 24 April 2021.

up on by many small evaluation studies, sometimes lacking ambition because of restricted budgets; bigger, more comprehensive exercises like system or institutional evaluations are still rare (Streicher et al. 2020, p. 74). In turn, the strategic input of evaluation fell short of its actual potential.

NEW APPROACHES – THE NEW LAW AT A GLANCE

Obviously, the RFA is not a catchall law, it rather addresses the crucial issue of fragmented financing structures which caused other elements of the RTI system to fail what they were designed to. The new legal provisions introduce three principal approaches reflecting the need for comprehensive and long-term planning. This means not only financial stability but also reliability of the underlying routines and institutions.

Firstly, the RTI budget chapters of the three major RTI ministries are now devised and decided upon by parliament for three consecutive years rather than one year as usual. These three years' budgets are binding, contrary to the four years' federal medium term expenditure framework whose budget appropriations are – beyond the actual budget year – only indicative. Also differently, the new three years' terms are fixed and follow one after another whereas the four years' medium term framework is rolling year by year. The principle of this revolving three years' cycle is intended to guarantee a continuous, high profile process of planning and reviewing RTI policy and its budgets. This process is centred on the so-called RTI pact which has to be negotiated amongst the federal government every second year of a three years' term determining the priorities and the budgets for the next three years. The RFA also stipulates that the budgets subject to this law must not be cut once passed by parliament (whose privilege it remains, of course, to alter its own decisions). This means no less than RTI expenditures being no discretionary expenditures anymore and the threat of budget cuts being over.

Secondly, those major research and research funding institutions controlled by the federal government are now legally established as "central institutions" in terms of the RFA. Acknowledging their importance and the control the government can exercise, these institutions are now granted a legal claim to federal funding. While this may have less effect on the actual size of the budget allocations themselves, there is a profoundly political argument to the approach of "central institutions": Whatever the current weight of RTI in political debates, a framing pertinent to known and accepted institutional concepts is far more persuasive and likely to succeed than mere budget lines. Fighting for taxpayers' money may very well prove a futile effort without directly connecting this to an institutional face, as it were.

The central institutions are divided into two categories: research performing and research funding institutions.

The central research institutions are:

- Austrian Institute of Technology (AIT)
- Institute of Science and Technology – Austria (IST)
- Austrian Academy of Sciences (ÖAW)
- Silicon Austria Labs (SAL)
- Ludwig Boltzmann Association (LBG)

The central research funding institutions are:

- Austrian Promotional Bank (AWS)
- Christian Doppler Research Association (CDG)
- Austrian Science Fund (FWF)
- Agency for Education and Internationalisation (OeAD)
- Austrian Research Funding Agency (FFG)

Thirdly, the RFA introduces performance and financing agreements as a new governance instrument for which the concept of "central institutions" is a prerequisite. These agreements will each last for three years and match the three years' RTI budget period. They are only applicable for the central institutions and the three ministries responsible for them with their respective RTI budget chapters. Against an international backdrop, this may seem a modest achievement. However, the limitations imposed by budget law as described above have prevented the implementation of such comprehensive agreements in Austria so far. The new law stipulates that for these agreements the limits for future obligations otherwise in place may be exceeded in case of commitments to the central institutions (and the liabilities therefore incurred). This is the key regulatory novelty in terms of budget law. Its effect can be illustrated by the case of FFG when previously far more than 50 single contracts needed to be executed at any one time. These are replaced by just two financing agreements (one per ministry responsible each). Following from that there is a greater chance to disentangle principals and agents and clarify their respective roles. Contending that bigger size leads to greater impact and attracts more attention we may expect that also evaluation gains more importance.

Even though the RFA undoubtedly eliminates or at least mitigates many of the most restricting obstacles, not all hopes and expectations could be met. These related, in the first place, to the budgets themselves whose administration is subject to the new law. It was often presumed that the law would determine the amounts of future budgets or at least an annual growth rate. This, however, is legally impossible, since according to constitutional law, the federal budget must be a single self-contained act so that no separate budgets for specific matters are possible. There would have been the option though to grant specific amounts to individual subjects, i.e. the central institutions. However, this did not seem feasible as the RFA aims at a comprehensive and dynamic system leaving enough room for manoeuvre to adapt to emerging needs and to cater for other than the central institutions.

Another objection regarded the question of autonomy, which is an issue of permanent debate and lasting tensions in research policy (Braun 2003). In the political discussions around the Research Financing Act, the governments involved often put the project into the context of a clearer division of labour and increased autonomy of the central institutions. This would come naturally once the ministries were not burdened with the micromanagement of myriads of single contracts anymore but would deal with big chunks of money instead, the argument went. Yet it is beyond the remit of this law (whose regulatory scope is budgeting of RTI) to provide stipulations on governance issues. Still some of these aspects are taken care of by the amendments to the organisational laws governing the central institutions that came with the RFA in order to incorporate the handling of the new agreements into the institutions' structures and processes.

BRIEF HISTORY

The idea of what was to become the RFA has been out there for quite some time. It was first conceived by Johannes Hahn (then minister of science and research) who launched it in 2009 on occasion of the Alpbach Technology Talks proposing a "mandatory budget path" and the introduction of performance agreements together with global budgets. Subsequently, the idea figured in the RTI strategy 2020 as well as in the government programmes of 2013, 2017, and 2020. Some of the points raised in the original proposal have later been addressed by the new Federal Organic Budget Act of 2013 such as the introduction of global budgets and medium-term planning.

It was not until the evaluation of FFG and AWS in 2017 and the OECD review of innovation policy in 2018 (OECD 2018; Bührer et al. 2017) that the proposal eventually gained enough pace to rank higher on the political agenda. In August 2018 the council of ministers decided that the (then) ministry of transport, innovation, and technology be mandated to negotiate a draft legislation. A task force was set up involving the ministries of education, science, and research; for digital and economic affairs; of finance, and the chancellery.

In May 2019 the proposal was almost completed when the so-called Ibiza scandal lead to the dissolution of the government. A caretaker government took over. Because the legislative project as such had largely been undisputed, it decided to finalise the proposal (renamed "Research Framework Act" in order to avoid any suspicions of effects on future budgets) and conduct the public consultation. Thus, the government incoming after the general elections in September 2019 was put in a position to devise a bill immediately. Delayed by the Corona pandemic, the new government presented the bill proposing the RFA to parliament in June 2020. The parliamentary debate acknowledged the achievement, nonetheless it focused on the question if the government was prepared to ask for budgets high enough so as to fully exploit the potential of the legislation. The opposition parties put forward several parliamentary motions to that effect, failing to gain a majority though.[3]

During all these steps towards the RFA, the issue of evaluation remained ambiguous, lingering in the background somehow, but never managed to become a primary motivation for pursuing that legislation.

HOW THEY DO IT ELSEWHERE

Obviously, the general approach that is laid out in the RFA has been chosen before in other countries. Yet following such examples is often difficult because the legal and political frameworks differ so much that despite similar challenges copying and implementing solutions found elsewhere is not directly an option. Still there are two examples that proved influential because they were found in neighbouring countries Austria frequently compares itself to, not least in RTI policy.

The German "Pacts for Research and Innovation" served as the benchmark most often referred to. This was primarily owed to the massive political effort behind these pacts propelling RTI into the limelight. However, there are some marked differences between the system of pacts and the Austrian situation. First and foremost, the German pacts are purely political documents having no legally binding capacity whatsoever, thus also ranging beyond parliamentary scrutiny. Their vigour results from the fact that they fit into a long established and carefully balanced system of division of power between the federation and the federal states. Once something is agreed upon among these actors politically, it must hold up. Hence, there is no need for a formally stronger framework. Yet it is exactly this design, which makes financial growth targets possible. The pacts merely proclaim that these targets shall be implemented subject to the respective budgets. But then, everyone knows from experience that this is in fact going to happen.

This mechanism soon became a blueprint for the Austrian discussion, while Germany was much envied for its stability of political commitments. While this (except the terminology "pact") could not be transferred to Austria – also because obviously the Austrian *Länder* play a much less important role – we find the principle of focusing on major institutions already in the German system covering the predominant "big five" jointly financed by *Bund* and *Länder*. Contrary to the Austrian system, other institutions and their budgets are excluded from the pacts. Moreover, the pacts are concluded for a limited time span (five, now ten years) and must therefore be renewed regularly. As regards evaluation, a monitoring framework hosted by the Joint Science Conference delivers annual monitoring reports based on data the respective RTI institutions are required to provide.[4]

Closer to the approach chosen in Austria is the Swiss system of RTI funding. Likewise, it is based on law (Federal Act on the Promotion of Research and Innovation) providing a legal definition of institutions subject to it, the introduction of performance agreements, and regulations for public financing at federal level including a permanently established revolving process. At regular intervals (four years), the Swiss federal government presents a bill to parliament on education, research and innova areas at federal level. Therefore, the bill also entails the respective four years' budgets for the eligible institutions. These budgets cover about 80 to 90 percent of all federal RTI expenditures (Widmer et al. 2018, p. 1). In terms of evaluation, Switzerland is known to be very consistent. Article 170 ("Evaluation of effectiveness") of the federal constitution states "that federal measures are evaluated with regard to their effectiveness."[5] Accordingly, article 44 of the Research and Innovation Promotion Act installs a periodic review of the Swiss research and innovation policy.[6]

3 For the entire legislative proceedings see https://www.parlament.gv.at/PAKT/VHG/XXVII/I/I_00239/index.shtml#tab-Uebersicht, last retrieved 24 April 2021.
4 See https://www.gwk-bonn.de/themen/foerderung-von-ausseruniversitaeren-wissenschaftseinrichtungen/pakt-fuer-forschung-und-innovation/, last retrieved 24 April 2021.
5 https://www.fedlex.admin.ch/eli/cc/1999/404/en#art_170, last retrieved 24 April 2021.
6 https://www.fedlex.admin.ch/eli/cc/2013/786/de#art_44, last retrieved 24 April 2021 (English version unavailable that day).

MONITORING AND EVALUATION IN THE RESEARCH FINANCING ACT

The German and Swiss examples also present ways to align multi-annual budgetary frameworks with a set of evaluation and monitoring rules and principles already in place. The provisions made in the Austrian case are not much different. At a first glance, the RFA appears moderate in terms of its evaluation requirements. Given its comprehensive scope, one may argue that it should have established an equally comprehensive evaluation framework as well. As said before, the new law is only one, if decisive, element of the legal framework regulating publicly financed RTI in Austria. Therefore, it must take account of evaluation rules already applicable and make its own regulations for evaluation compatible with them.

As a general approach, section 1 of the RFA states as one of the goals "the improvement of RTI performance and the analysis of the outcome achieved." This clause implies evaluation as a logic consequence from the law. The explanatory notes that accompany the bill proposing the RFA[7] elaborate that in order to guarantee outcome and impact orientation, the performance and financing agreements shall be subject to a consistent monitoring and evaluation system. The monitoring implemented accordingly will facilitate measuring and analysing the outcome achieved as well as identifying room for improvement (pp. 2-3). Said monitoring and evaluation system is set out in section 8 ("monitoring and evaluation"). It establishes an annual reporting system that is indicator based, outcome oriented and highly aggregated. Its results are reported in the annual Austrian Research and Technology Report (which has already been pioneered in 2020, pp. 94-159). Reporting refers to the central institutions (on whose data it is based) and must include a target-performance comparison with corresponding conclusions. Furthermore, an overview of the implementation of the RTI pact has to be provided (sec. 8 para. 1 and 2). The explanatory notes point out that this set-up is also designed to avoid the creation of parallel structures as it uses existing ones for data collection and reporting, and that it is intended to serve as a controlling tool (p. 12).

In the same vein, on evaluation section 8 explicitly refers to section 18 of the Organic Budget Act (BGBl. I No. 139/2009[8]) where evaluation is established as a mandatory legal requirement for almost all public measures at federal level. Because this is a very broad concept, evaluations pursuant to this regulation yield rather unassuming results (Pichler/Steyer 2017). These evaluations are deemed "internal" and "must show … whether and to what extent the goals and targets have been achieved and what the impacts of the measures are and how great the actual financial impacts on the federal budget are." (sec. 18 para. 3) The baseline against which legislative proposals and other projects have to be evaluated are the outcome-oriented impact assessments (sec. 17). Such evaluation is applicable to the performance and financing agreements (and, of course, to the RFA itself). In line with the directive of the ministry of finance (BGBl. II No. 489/2012[9], sec. 11) pursuant to section 18 para. 4 of the Organic Budget Act, the RFA requests that recommendations on the implementation of the agreements and potential improvements be included (sec. 8 para. 3).

For that purpose, under the RFA the central institutions have to supply the necessary data and must provide for an appropriate monitoring system (sec. 8 para. 4 and 5). This is mirrored in the minimum requirements for performance and financing agreements. The agreements have to request the central institutions to collect, supported by a corresponding reporting system, indicators based on which the attainment of the goals and the outcomes can be measured (sec. 6 and 7). The explanatory notes detail that the indicators may take the form of metrics or milestones (in accordance with the aforementioned directive) and should represent categories allowing for comparisons among the central institutions (pp. 10 and 12).

Therefore, the primary approach of the RFA towards evaluation is to limit itself to what is already legally defined by law. This is perhaps also a lesson learnt from numerous other laws demanding evaluation without further specification. This does not mean that the RFA does not also cater for fully-fledged evaluations performed by external experts without, however, making them compulsory. Again, section 8 states that the purpose of the data supplied is "the preparation of scientific analysis and the execution of scientific evaluation measures" (para. 4). The central research funding institutions can also be endowed by the agreements to finance evaluation contracts themselves as accompanying measures (explanatory notes p. 11 to sec. 7). The decision if, how and when to conduct external evaluations is thus left to those responsible for or within the central institutions.

CONCLUSIONS

The RFA yields no standard recipe for evaluation. Yet it paves the way towards better and more consistent evaluation. The new legal framework offers a unique opportunity to tie loose ends together. Despite the prolonged existence of different legal angels relevant to the implementation of RTI policies – and thus evaluation – there is now a policy cycle in place through the RFA leading to a convergence of policy elements otherwise lacking a coercive common guidance. The new revolving processes of planning the three years' periods and of developing and implementing the performance and financing agreements should result in a better understanding of the importance of evaluation: better planning needs better evaluation. Not least, the larger chunks of money that are now handed over to the central institutions and the larger programmes that should come with that will call for more attention. In turn, this is likely to raise the need for accountability, justification and evaluation. However, it will remain a combined effort of all those involved to deliver proper evaluation. This still is a matter of cultural change, which no law can possibly decree.

7 See https://www.parlament.gv.at/PAKT/VHG/XXVII/I/I_00239/index.shtml#tab-Uebersicht, last retrieved 24 April 2021.
8 https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=20006632, last retrieved 24 April 2021.
9 https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=20008150, last retrieved 24 April 2021.

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AUTHOR

RUPERT PICHLER
is Deputy Director General for Innovation and Technology and Head of the Department for Research and Technology Funding at the Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation, and Technology.

Radetzkystraße 2
1030 Wien
E: rupert.pichler@bmk.gv.at

HOW TO EVALUATE A TRANSITION – ORIENTED FUNDING PROGRAMME?

LESSONS LEARNED FROM THE EVALUATION OF FONA, THE GERMAN FRAMEWORK PROGRAMME TO PROMOTE SUSTAINABILITY RESEARCH

SARAH SEUS AND SUSANNE BUEHRER

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practice paper

ABSTRACT

This article is based on the evaluation of the German research funding programme "FONA - Forschung für Nachhaltigkeit" (Research for Sustainability.) It reflects upon the methodological challenges confronting the evaluation. These challenges result from the specific objectives and design of the FONA programme (a strategic portfolio of heterogenious interventions). FONA's ambition is to fund activities under the emerging field of 'sustainability research'. The core characteristics of sustainability research are: interdisciplinary and transdisciplinary research processes; orientation towards transferring the research results (into society) and the interdependency with a wider system and global perspective.

For illustration purposes, a selection of key evaluation results is presented. These results highlight the effects that the funding has had on the research community, the development of sustainability research in Germany, and the effects on non-scientific sectors (especially the economy and the public sector). The article concludes that the evaluation's design (multi-level and multi-method approach, theory-based evaluation) was suitable for tracing the different effects in different impact domains. It is especially suitable for analysing interventions that aim at institutional changes in academia and societal transformation.

1 INTRODUCTION

Sustainability research is not a clearly defined scientific discipline, nor can it be pinned down to specific topics[1]. There are two connecting elements of sustainability research (Komiyama and Takeuchi 2006; Gallopín et al. 2001): first, the alignment of scientific research to societal problems in order to contribute to societal transformation processes. Second, how the research is conducted. Sustainability research aims at providing solutions to existing societal (grand) challenges such as climate change or biodiversity conservation. Hence, the usability and transferability of research results into non-academic settings form a core component of sustainability research. This implies changes to the research process itself: Sustainability research aims at transcending disciplinary boundaries by combining different scientific disciplines to address a problem (for a definition of "interdisciplinarity", see van den Besselaar and Heimeriks (2001)). It involves non-scientific stakeholders both in the definition of the research questions and in the execution of the research work (definition of "transdisciplinarity" according to Pohl (2011)). It also includes an international perspective, especially the implications of the research for countries in the Global South (internationality). In sum, the FONA funding approach reflects a systemic perspective of research and considers the different impacts that research can have beyond the scientific community.

Applying these characteristics to research, sustainability research has been a fast growing field over the last 20 years[2] (Bührer et al. 2020b) and has gained importance and recognition both within and outside the scientific community.

FONA - GERMAN FEDERAL RESEARCH FUNDING FOR SUSTAINABILITY

In recent years, research funding organisations and research funding have increasingly referred to global challenges and sustainability goals in their strategies and research calls. Since 2015, most references have been made to the sustainable development goals (SDG). The German framework programme for sustainability research FONA "Forschung für

1 Indeed, there is not even a commonly agreed name for it. The expression "sustainability science " is used when speaking about the scientific discipline (see Koniyama et al. 2006), but the expression "sustainability research" is found when (transformative) research processes are investigated (see Wiek et al. 2016). The BMBF named its funding programme "Research for Sustainability". For simplification reasons, we use the term "sustainability research".

2 The formation of a new research discipline can be measured in a) a high increase in the number of publications in the last years, b) the creation of new academic journals focusing on the topic, c) institutional changes in research-performing organisations, e.g. the creation of research groups and research institutes dedicated to the new research discipline.

3 The four phases of FONA are: FONA 1: Research for Sustainability (2005-2009), FONA 2: Research for Sustainable Development (2010-2014) and FONA 3: Research for Sustainable Development (2015-2019), FONA 4: FONA Strategy (2020-2025).

Nachhaltigkeit" is one of the early examples of this trend. The German Federal Ministry of Education and Research (BMBF) established FONA in 2005. Since then, three programming phases have been implemented. The fourth FONA phase was launched in 2020.[3]

FONA has been designed to emphasize the interactions along value chains and between environmental, economic and societal processes. With the FONA framework, the BMBF focused at a very early stage on a type of research that did not only target pure knowledge generation or the generation of innovations as such, but was explicitly oriented towards global challenges and included the perspectives of diverse societal stakeholders. Furthermore, the FONA framework considers wider policy discussions in Germany and on EU / global level with regard to sustainable development.

These rationales led to the development of FONA's core elements that are still at the heart of FONA research projects today: interdisciplinarity, transdisciplinarity, solution and transfer orientation, internationality and systems thinking. The main concern in early FONA periods was setting the stage, especially integrating the core elements of sustainability research into the research funding procedures and research processes. The following objectives guided the first two FONA periods:

- Promote sustainability research (i.e. improve the knowledge base) and strengthen sustainability research specifically in Germany.
- The funded projects should produce results that are applicable and useful in practice and help to address societal challenges. In addition to technologies and marketable products, this explicitly included knowledge and recommendations that can be used for political decision-making processes or public planning.

The overall ambition of FONA is to change the way individuals and organisations think and act with regard to sustainable development, both in academia and wider society.

Between 2005 and 2019, a total funding volume of approximately 5 billion euros was disbursed. About 10,000 research projects received funding. The activities supported by FONA were highly diverse: traditional research collaboration projects, but also junior research groups and research infrastructures such as submarine robots and the research vessel "SONNE"[4]. It also provided funds for secretariats and research coordination bodies, such as the secretariat of ICPP Working Group III (2008-2015). Funding was not only channelled to applied research, but also towards basic research.

The beneficiaries of FONA are also heterogeneous: 78% of funding is assigned to research performing institutions, both universities and non-university research institutes. 14% of the funding goes to companies, both SMEs and large enterprises. Approximately 7% of the beneficiaries are other societal stakeholders, either local / regional authorities or civil society organizations. In terms of the topics funded, FONA covers a wide range of environmental topics ranging from polar research to sustainable materials, and biodiversity protection to social-ecological research.

The following contribution is based on an evaluation of the FONA strategic framework, especially FONA 1 and FONA 2. Its aim is twofold: First, it discusses the methodological challenges of the evaluation resulting from FONA's objectives that go beyond traditional research funding rationales and from the framework's complex design. Second, selected evaluation findings are presented to show how FONA has contributed to change processes at the level of stakeholders and organisations and at the (research) system's level to some extent.

2 EVALUATION DESIGN AND METHODOLOGICAL CHALLENGES

The evaluation of FONA 1 and 2 periods was designed as an ex-post evaluation aimed at providing information about the following categories: goal achievement, effectiveness, efficiency and programme management. Its purpose was mainly accountability, but it also included elements of learning, especially with regard to the future development of the FONA framework.

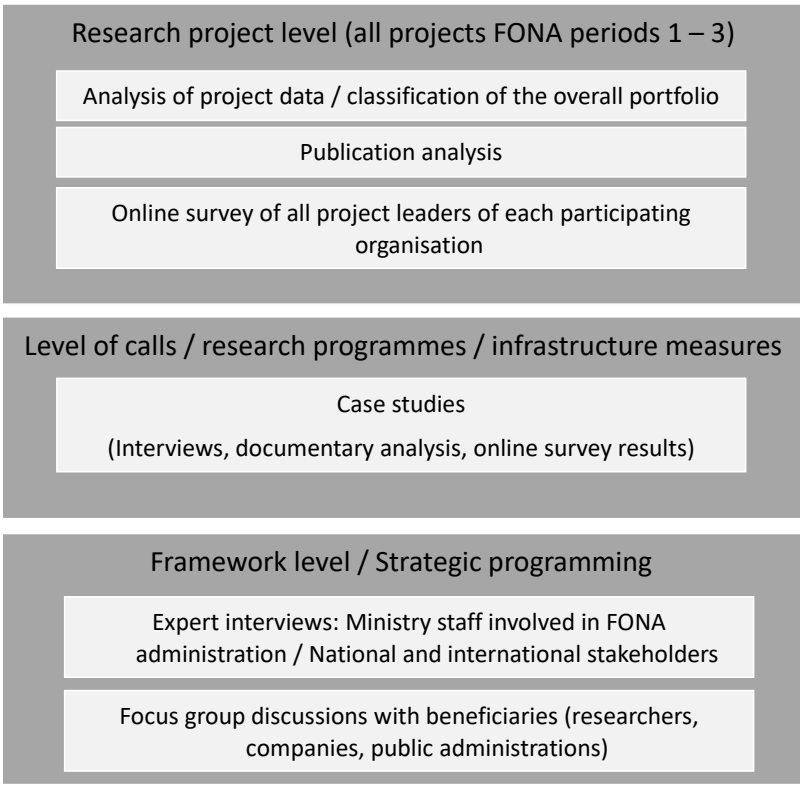
The evaluation faced the following specific challenges:

1. The FONA framework is versatile, complex and – in the German funding landscape - unique: it incorporates a broad variety of research funding instruments, beneficiaries, topics and research modes. The high number of individual programmes and the variety of actors administrating the activities under the umbrella of the FONA Strategy pose challenges for data collection as well as for the aggregation of data and an analysis at framework level.
2. The (emergent) characteristics of sustainability research (inter- and transdisciplinarity, a systemic and international perspective when conducting research) are common elements of most research activities. However, these core elements of sustainability research are a new way of perceiving and doing scientific research This new approach raises questions about the criteria used to evaluate the quality of these new research collaborations and their results.
3. FONA-funded research intends to have effects not only on the science system, but on other societal spheres as well. Currently, there is a broad discussion within STI communities of how to measure the effects of research projects beyond the science sector and relate the funding stimulus to wider impacts . However, so far there is no agreed methodology to qualify societal impacts (Bührer et al. 2021, pre-published) and further methodological and conceptual efforts are needed to capture such effects.

The evaluation addressed these challenges as follows: Challenge number 1 was addressed by a multi-level analysis of the programme implementation and by combining qualitative and quantitative, reactive and non-reactive methods as shown below.

4 https://www.deutsche-meeresforschung.de/en/sonne

Figure 1: Methodological approach of the FONA evaluation



Source: Fraunhofer ISI, own illustration

More specifically, the following methods were used: an online survey resulting in 3,843 valid records, 80 interviews, three focus groups with 26 participants in total, and 20 case studies involving desk research as well as interviews. In addition, bibliometric analyses, document analyses and the analysis of the German federal research funding database "profi" were used.

Challenge number 2 was addressed by including the core elements of sustainability research as stand-alone evaluation criteria. These criteria (interdisciplinarity, transdisciplinarity, transfer orientation, systemic perspective, internationality) can be seen as necessary features of research processes without which impacts on society and changes at the level of the science system cannot unfold.

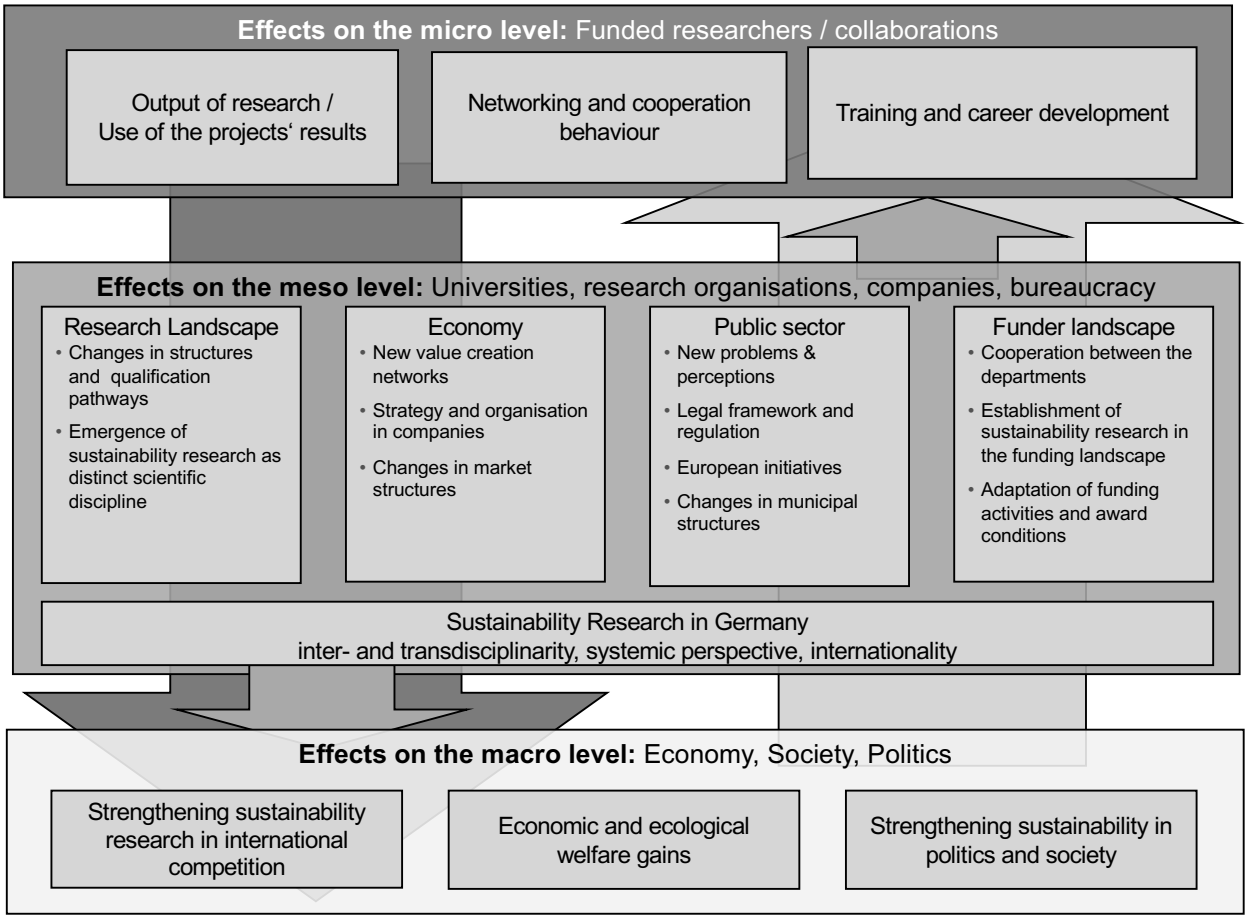
Challenge number 3 was addressed by systematically covering both impact levels (see Figure 2) and various impact dimensions. Specifically, the evaluation approach reflected that FONA's objective is to reach the different levels at which funding is intended to have effects (the micro-level of individual beneficiaries / researchers, the meso-level of involved organisations like universities, enterprises, municipal actors, and finally the macro-level of the national economy and society). Furthermore, not only typical scientific and economic impacts were considered, but also environmental impacts, societal impacts as well as policy and systemic impacts.

The following figure shows the different levels at which effects are intended, as well as the different impact dimensions addressed by the funded research. This logic model was developed at the beginning of the evaluation and further refined during the evaluation. It has helped to operationalise the intended effects in each "sector" and was used as the basis for developing indicators and / or descriptors. For the micro-level, we used primarily traditional scientometric indicators (e.g. publication and citation rate, co-publication rate) as well as other well-known research performance indicators of , including effects on research actors (e.g. career development). The novelty of our evaluation was to define descriptors for the meso level. For each type of organisation considered at the meso level (science, business, public administration), an intervention logic was outlined, focusing on the expected results on the research landscape, the economy, public policy and administration. These intervention logics used either existing indicators, derived from numerous evaluation studies focusing on science-industry-relations, or developed descriptors qualifying the results for the four selected areas.

The impact model of FONA funding was also designed to observe and record potential effects on the overall economy as well as on society and political processes at the macro level. However, the aim was not a final quantification of the program and its effects. This is not possible due to the following specifics of the programme: Research for sustainability is about generating new (action) knowledge. However, the studied phenomena are embedded in a system in which different rationalities, stakeholders and activities are interwoven and interdependent. An individual impulse can have an effect, but it has to be considered in its ecosystem and network of influencing factors.

The complexity of the programme would have required different approaches to data generation in order to quantify its effects on a macro level. It would also have required a determination of the status quo beforehand and a definition of the relevant target values. As these were not part of FONA's strategic framework, it was not possible to quantify its contributions. For this reason, we used case studies to trace plausible cause-effect relationships based on theory-based impact models. Ultimately, these case studies often remain at the level of anecdotal evidence.

Figure 2: Overview of expected impacts of FONA



Source: Fraunhofer ISI, own illustration

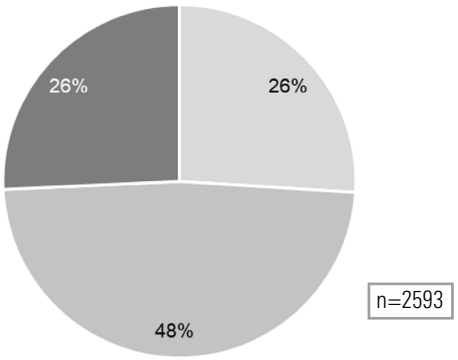
3 SELECTED RESULTS TO ILLUSTRATE THE MULTIPLE EFFECTS OF FONA FUNDING

In this chapter, we present selected findings of the evaluation and focus especially on how the FONA funding has contributed to trigger change processes among researchers, and research organisations, to develop and strengthen a German community for sustainability research, and has also reached out into society.

SETTING THE BAR FOR INTERDISCIPLINARY RESEARCH COOPERATION

Interdisciplinary collaboration was very high in FONA projects. In 75% of the projects surveyed, more than two disciplines worked together. In about a quarter of the projects, engineering and natural scientists worked together with researchers from the humanities, social and cultural scientists.

Figure 3: Percentage of interdisciplinary research projects



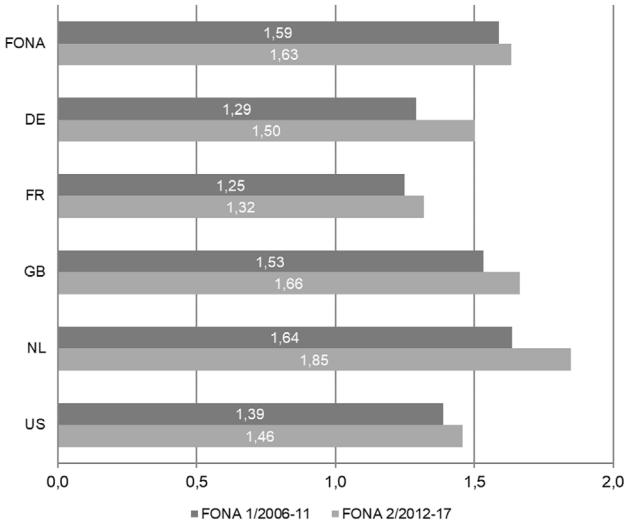
Source: Survey of project leaders 2018, calculation Fraunhofer ISI

The cooperation in interdisciplinary consortia was rated very positively by the project leaders interviewed. There were some obstacles such as communication and internal team organisation problems, but these were not dominant. Findings from the expert interviews, case studies and the focus group on interdisciplinarity indicated that the interdisciplinarity functioned, but that clear potential for improvement remains, especially with regard to the joint formulation of research questions. This may also be due to the fact that interdisciplinarity is now required in many FONA calls for proposals, but the criteria for assessing the intensity of interdisciplinary exchange in the proposed research projects are not sufficiently clear. The evaluation concluded that the BMBF, as the largest German funding body for sustainability research, has contributed to further advancing interdisciplinary research and to qualifying a community of scientists for this type of research through the FONA programmes.

STRENGTHENING SUSTAINABLE RESEARCH

The overall aim of the Federal Ministry's funding scheme is to finance excellent research and to increase the visibility and reputation of German research internationally. The analysis of the publications of the project leaders involved in FONA showed that the FONA-funded researchers published a lot and well across all the indicators traditionally considered relevant to measure research excellence, such as the number of co-publications and citation rates. In addition, all the indicators showed an increase between funding period 1 and funding period 2, as shown in the next figure.

Figure 4: Citation rate of FONA beneficiaries in comparison to other countries in the field "sustainability"



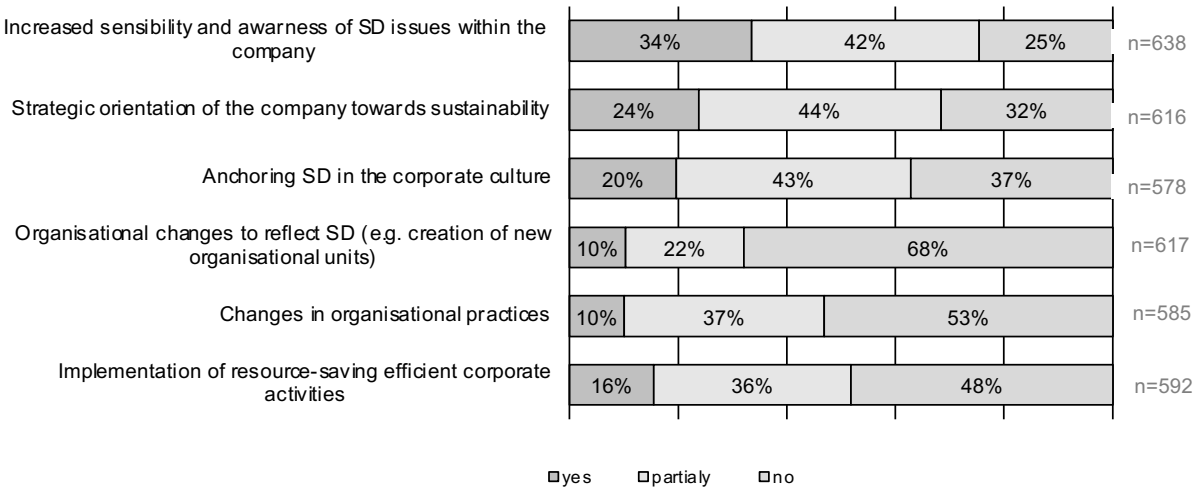
Source: Scopus data, calculation Fraunhofer ISI

Furthermore, the analysis of co-publications shows that the German research community in the different disciplines related to sustainability research has become well connected over time, particularly within Germany, but increasingly also internationally.

CHANGE PROCESSES IN COMPANIES

During the FONA funding periods, the benefitting companies reported an increased awareness of sustainability issues, new activities (e.g. resource-saving activities) and even organisational changes to company structure (e.g. changes in business units or in the strategic orientation of the company) (see Figure 5 for details). To a certain extent, these developments can be explained by the participation in collaborative research projects and interaction with partners. However, external triggers, such as changes in the demand for more sustainable products or processes, increased consumer awareness and more legal requirements, (e.g. the CRS reporting obligation), also have a strong influence on company behaviour with regard to sustainable development. Sustainability is now a priority in many companies. FONA was able to benefit from these external influencing factors.

Figure 5: Structural effects on corporate strategies

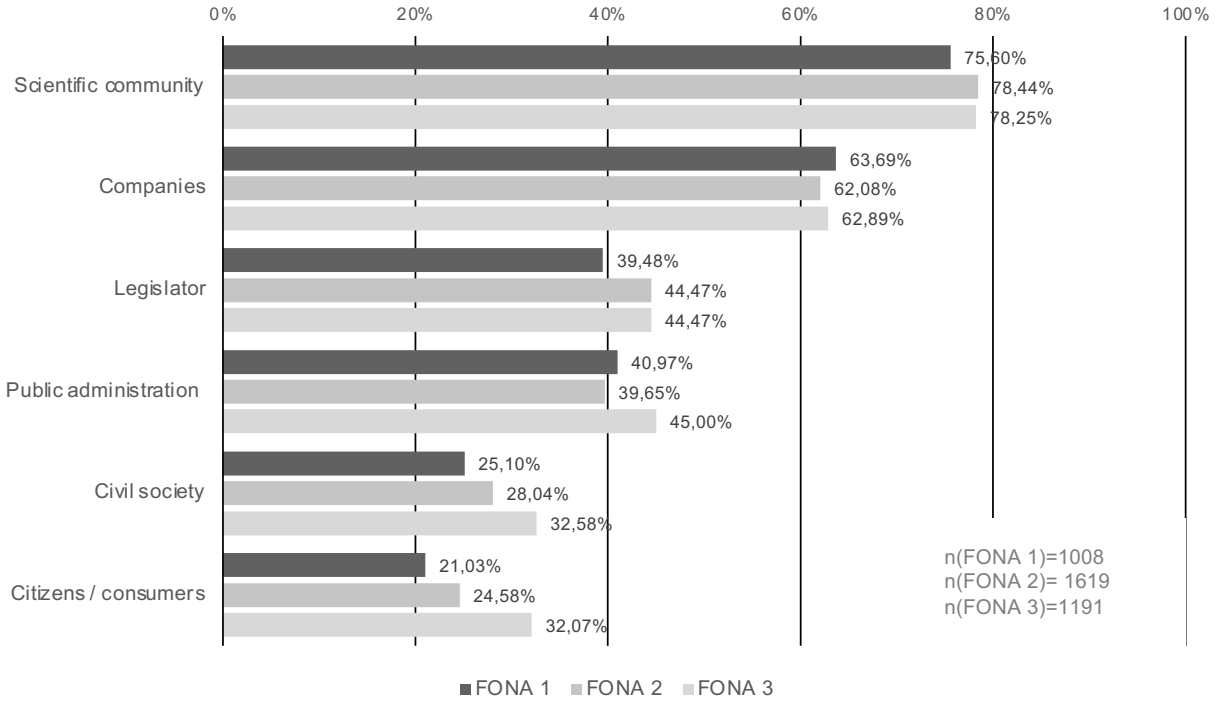


Source: Survey of project leaders 2018, calculation Fraunhofer ISI

REACHING OUT TO NON-SCIENTIFIC STAKEHOLDERS

FONA's aim to reach out to societal stakeholders can be seen in Figure 6, which shows the target groups of research projects.

Figure 6: Target groups of research results

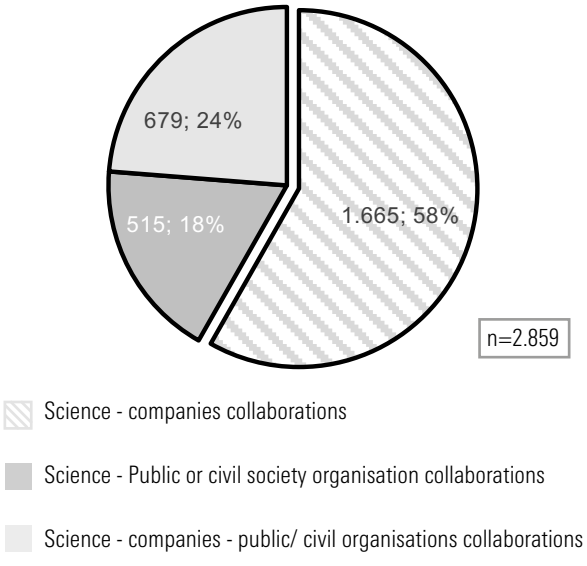


Source: Survey of project leaders 2018, calculation Fraunhofer ISI

As expected for a research programme with a long tradition in environmental technologies, the largest target groups are scientists and R&I performing companies. However, the evaluation showed that public and societal stakeholders are also seen as direct users of research results. The importance of these groups grew continuously and statistically significantly between FONA 1 and FONA 3. It is expected that this trend will continue in the current FONA Strategy.

The evaluation found that about 40% of the funded FONA projects were transdisciplinary cooperation projects in the narrower sense[5], i.e. cooperation that includes societal stakeholders and public administration in research projects. Over the course of the FONA periods, there was an increase in such transdisciplinary alliances.

Figure 7: Type of stakeholders involved in transdisciplinary research projects

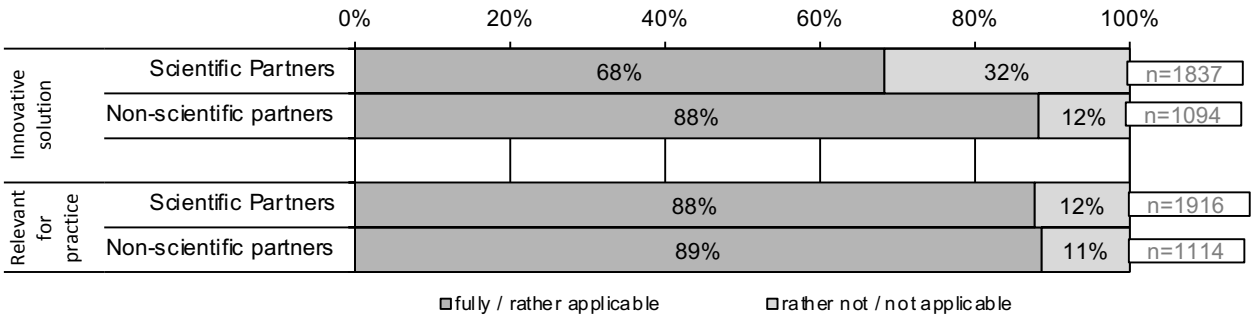


Source: Survey of project leaders 2018, calculation Fraunhofer ISI

5 As R&I activities can also be performed in companies, the decision was to made to exclude collaboration between science and industry actors from the evaluation, i.e.transdisciplinarity in a broader sense.

Working in inter- and transdisciplinary projects made research more relevant to societal problems, but was also more innovative, at least from the viewpoints of the survey respondents (see figure below).

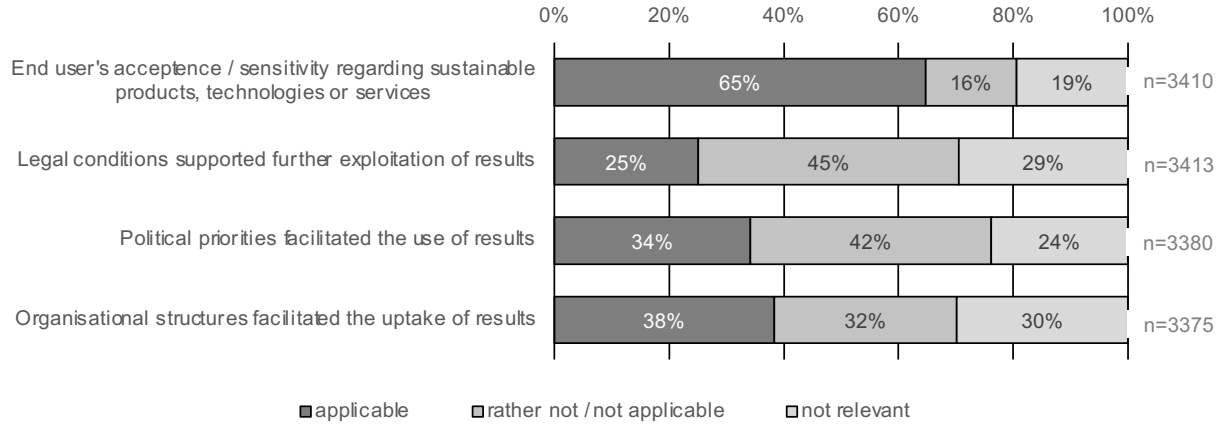
Figure 8: Assessment of innovativeness and relevance of research results in collaborative projects



Source: Survey of project leaders 2018, calculation Fraunhofer ISI

Transdisciplinary research projects can provide the initial spark for changes in economic and public organisations. However, such projects are embedded in contexts that heavily influence the conditions for successful transfer and sustainable use of the research results. Figure 6 shows the importance of the framework conditions for transfer success. While a transdisciplinary research project cannot influence the legal conditions, political priorities or organisational structure, it can influence the views and acceptance of the involved project partners on issues related to sustainable development.

Figure 9: Relevance of context for the effectiveness of the funding



Source: Survey of project leaders 2018, calculation Fraunhofer ISI

CONCLUSIONS

FONA achieves results on different levels, reaches out to different societal domains and thus has effects beyond those of conventional funding schemes. This is a result of the strategic framework with its overarching aims to produce scientific knowledge that is relevant and usable for society and its focus on including new elements of sustainable research (inter- and transdisciplinarity, internationality and a systemic perspective in the research projects and processes). At the same time, FONA has provided a considerable amount of funding over a long period. Good use has been made of the different funding instruments, funding purposes, topics and stakeholder constellations and these have been constantly adapted over the funding periods. FONA can thus be seen as a "learning programme".

Some general lessons learned were derived from conducting this evaluation for future evaluations of research programmes aiming at the transformative change of society, including the science system.

First, context sensitivity is crucial (Bührer et al. 2020a): not only the measure itself, but also its context is decisive for its impact and this is especially true for programmes with the very broad target of institutional change and transformation. For FONA, with its main objectives to direct scientific research towards societal needs and provide the knowledge and solutions required for societal problems, this means that the current logic of research-internal rewards and incentive systems works against changes in the current science system. National programmes can (only) provide impulses here. They send an important signal to other research funding organisations.

Second, given the very slow pace of structural change, the most inappropriate assumptions regarding (complex) policy interventions is that their impacts can and should be observable within a short period and that their success is directly measurable. As the changes in target groups between the three funding periods show, restricting a programme's evaluation to a few years after the programme's or project's completion would miss many valuable effects (for the challenges associated with impact assessments, see, e.g. European Court of Auditors 2008, Reale et al. 2015, Feller 2007).

Third, there is increasing consensus within the evaluation community that interventions only 'contribute' to the outcomes and impacts together with other contextual factors influencing the intervention's outcome (Delahais & Toulemond 2012, Vanessen & Raimondo 2012 and Mayne 2012).

From a methodological perspective, a pluralism of methods is a quality criterion for evaluations. However, a qualitative approach focusing on explanatory factors rather than indicators is particularly suitable for complex evaluation objects like FONA. In addition, the long-term perspective that the evaluation was able to adopt (2005-2019) made it possible to qualify (and to some extent quantify) effects that only emerge after years.

The design phase of the evaluation benefitted from laying out and describing the different levels at which the intervention is intended to have effects (in our example, the differentiation into micro-meso-macro levels fitted very well) and differentiating the various impact domains. What was lacking, however, was more intensive stakeholder involvement in all the evaluation phases including the design phase, as required by evaluation scholars (Molas-Gallart et al. 2020). This should be taken into account in the future. However, we also acknowledge the limitations of contract research (typically used for ex-post evaluations), both financial and in terms of the available time.

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AUTHORS

SARAH SEUS
Fraunhofer Institute for Systems and Innovation Research (Germany)
Breslauer Str. 48
76139 Karlsruhe
T: 0049-721-6809-344
E: sarah.seus@isi.fraunhofer.de
ORCID: 0000-0003-0791-5919

SUSANNE BUEHRER
Fraunhofer Institute for Systems and Innovation Research (Germany)
Breslauer Str. 48
76139 Karlsruhe
T: 0049-721-6809-148
E: susanne.buehrer@isi.fraunhofer.de
ORCID: 0000-0002-1923-1437

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PATTERNS OF GEOGRAPHICAL MOBILITY OF RESEARCHERS FROM SIX WESTERN BALKAN COUNTRIES IN REGIONAL AND EUROPEAN MOBILITY BASED TRAINING PROGRAMMES

KLAUS SCHUCH

DOI: 10.22163/fteval.2021.516

1. ABSTRACT

The aim of this paper is to analyse the mobility of researchers from the six Western Balkan Countries, Albania, Bosnia and Herzegovina, Kosovo*[1], Montenegro, North Macedonia, and Serbia (abbr. WB6) within structured regional and European mobility programmes. We want to identify geographical patterns with a view on mobility-based training from the WB6 region to the EU, but also within the WB6 region.

The following structured regional European programmes provide the basis for this comparative analysis

- CEEPUS
- ERASMUS +
- Marie Skłodowska-Curie Actions (MSCA)
- COST

Mobility of researchers is regarded as one of the most powerful approaches for integrating WB6 researchers into the European Research Area. Since more than one decade different considerations have been pondered as to which measures could best support researcher mobility in the region as well as in exchange with the EU. On the other hand, the Western Balkan region has suffered from migration of large numbers of scientists, engineers, and technicians for decades. Structured mobility schemes, which enable knowledge exchange and knowledge inclusion processes through non-permanent stays abroad are often considered as adequate tools for mitigating the integration challenge and to contribute rather to 'brain circulation' than 'brain loss'.

The results show that all WB6 make intense use of the scrutinised programmes. Although participation in MSCA is low in absolute numbers, this programme is also well used when put in relation to the existing scientific human capacities in the countries studied. The available data also show that all programmes are used for both trans-European and intra-regional research mobility. However, outgoing mobility from the WB6 is almost consistently higher than incoming mobility, which may be a lag effect on the one hand, but also an indication of underdeveloped regional attraction conditions.

The results presented here are from a study conducted by the author for the CEEPUS Secretariat in 2019. The data, insofar as it was publicly available, was subsequently updated until the summer of 2020. No evaluative assessment is undertaken within the framework of the study.

2. INTRODUCTION

Four structured mobility programmes are scrutinised in this paper: CEEPUS, ERASMUS +, Marie Skłodowska-Curie Actions (MSCA) and COST. We use the term 'structured mobility programmes' for RTI policy measures targeted at (mostly but not exclusively younger) researchers, who go abroad for a limited time for training or professional advancement. The research stay takes place through a structured integration into at least partially organized training or further education programmes (e.g. doctoral programmes; laboratory training; training schools) or joint research activities, which often take place within the framework of temporarily established (mostly university) network partnerships. Another structural feature is, that the return of the researcher is planned or at least explicitly requested. This fulfils the requirement of the so-called 'brain circulation' opposed to 'brain drain'.

The selection of programmes and schemes does not claim to provide a complete picture on mobility-based training in the region, although it covers the most important structured mobility programmes available. The WB6 have also unilateral mobility programmes, but often they are not limited to the EU or the WB6 region, but are open to world-wide mobility. Additionally, they are often quite limited in terms of the number of available fellowships or grants. Unilateral mobility programmes of non-WB6 countries open to incoming researches from abroad, such as the ones

1 This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo declaration of independence. We use * after the name Kosovo throughout the text to indicate this circumstance.

provided by the German DAAD or the Humboldt Stiftung are excluded as well. Short-term mobility exchanges within bilateral intergovernmental agreements or Memoranda of Understanding concluded between the WB6 governments or their main agencies and research organisations with their counterparts are neither considered.

After an overview in section 3 on the role of researcher mobility within regional and European integration processes, our empirical analysis starts with CEEPUS in section 4. CEEPUS was the first regional programme with a focus on supporting network-based mobility exchanges of students and researchers in the region of Central and soon Southeast Europe. CEEPUS has leveraged impressive numbers of mobility exchanges from January 1995 until today. We have analysed data from the academic year 2005/2006 until 2019/2020 provided by the Central CEEPUS Office to the author.[2]

Then, in section 5, we analyse the geographic patterns supported by European programmes. First, we analyse ERASMUS+, the most powerful European mobility exchange programme, which has opened up and remarkably increased its outreach towards the WB6 during the last couple of years. Data were provided by Austria's Agency for Education and Internationalisation (oead) covering the academic years 2014/2015 until 2016/2017. In addition, data between 2015 and 2019 were analysed based on information provided through country fact sheets published by the European Commission.

Marie Skłodowska-Curie Actions (MSCA), which are analysed in section 6, comprise the main schemes to support structured mobility of researchers within the European Research Programme HORIZON 2020. Data on MSCA are taken from country sheets provided by the European Commission covering the duration from 2014 until 2020.[3]

At European level, the COST programme also organises research-based mobility exchanges within organised networks. The most recent 2019 data published by COST in country fact-sheets are analysed[4]. These data, however, do not contain the target countries of the mobility. Thus, only the participation of WB6 in COST actions are analysed in section 7.

We finally make a summary and draw conclusions in section 8.

In order to better position the WB6 participation within the structured mobility schemes and to trace mobility exchanges within the WB6 neighbourhood, we also recorded some comparative data for Austria, Bulgaria, Croatia, Greece, Hungary, Romania, and Slovenia. All these countries, plus the Czech Republic, Moldova, Poland, Slovakia and the WB6 are member countries of CEEPUS. With the exception of Austria, the countries covered are characterised by somewhat weaker research and innovation systems compared to developed EU countries (European Commission, 2020b). Whenever it was possible, we carried out gender-specific analysis as well.

3. RESEARCHER MOBILITY AS A STARTING POINT FOR SYSTEM INTEGRATION

Increasing the connectivity of researchers within the region but also between WB6 and European research communities is a long-term process that requires multiple efforts on different levels. In the specific case of WB6, this integration effort is embedded in a number of policy agendas including

- the process of EU accession, which is most profoundly characterised by the adoption or adaptation of regulations with a view on the acquis communautaire;[5]
- the reform and strengthening of national and regional research systems, which require strategic policy-making to set enabling framework conditions;
- the implementation of various policies, programmes and instruments facilitating the integration challenge and
- the establishment of databases and statistics for monitoring purposes.

For the cooperation of WB6 researchers with European counterparts, mobility of researchers is regarded as one of the most powerful integration approaches. The integrative power of mobility was prominently featured in the processes of the formation of the European Research Area[6], (ERA) (European Commission, 2020a). In the Green Paper "The European Research Area (ERA): new perspectives", published by the European Commission in April 2007, an adequate flow of competent researchers was mentioned as a first priority. Today, one of six current priorities of ERA, i.e. priority 3 ('an open labour market for researchers') is directly related to mobility, while others, such as priority 5 ('optimal circulation, access to and transfer of scientific knowledge including knowledge circulation and open access'), indirectly relate to it.[7] To better coordinate and forward the ERA priorities, ERAC (the European Research Area and Innovation Committee) dedicated one of six of its permanent working groups to this priority: the ERAC Working Group on Human Resources / Mobility (SWG) (European Commission, 2019).

2 CEEPUS requested a study on the „Uptake of European Programmes in the CEEPUS Cooperation Area" in 2019 (Schuch, 2019), which provides a sound basis for this analysis.

3 https://ec.europa.eu/research/mariecurieactions/resources/document-libraries/h2020-marie-sklodowska-curie-actions-msca-country-factsheet-associated_en; accessed on 31 July 2020 and https://ec.europa.eu/research/mariecurieactions/resources/document-libraries/h2020-marie-sklodowska-curie-actions-msca-country-factsheet-third_en; accessed on 31 July 2020.

4 https://www.cost.eu/wp-content/uploads/2020/07/COST-Country-Fact-Sheets-2018.pdf; accessed on 31 July 2020.

5 All WB6 have a perspective to accede to the European Union and hence are also called ‚enlargement countries'and COST Annual Report 2020a.

6 The Lisbon Treaty defines the European Research Area (ERA) as a unified research area open to the world and based on the Internal Market. The ERA enables free circulation of researchers, scientific knowledge and technology. The initial political concept of the ERA was launched by the publication of the Communication Towards a European Research Area in 2000 (European Commission 2000). The main objectives of this initiative were to boost Europe's competitiveness, to improve the coordination of research activities on national and European level, to develop human resources, and to increase the attractiveness of European research to the best researchers from all over the world.

7 The other four priorities are
- More effective national research systems
- Optimal transnational cooperation and competition, including optimal transnational cooperation and competition and research infrastructures
- Gender equality and gender mainstreaming in research
- International cooperation.

Although ERA and the European mobility programmes were created by and for the European Member States, it is also of importance for the WB6, because the integrative ERA understanding was soon enlarged towards accession countries and countries associated to the respective European Framework Programme for Research and Innovation (currently HORIZON 2020 lasting from 2014 to 2020). All WB6 with exception of Kosovo* are associated to HORIZON 2020 and all associated countries can participate as observers in ERAC. This enables them to take part in the discussions (but not in decision-making) and to prepare for further integration in the European Research Area. All WB6 have committed themselves to work on the current ERA priorities (World Bank, 2013). In 2016 the innovation dimension was added to the initial focus on research[8] and enlargement countries were to indicate via the Economic Reform Programme which reforms they envisage on research and innovation.[9]

Under Pillar 2 'Smart Growth', mobility to enhance quality in education and competences is explicitly featured in the regional growth strategy 'SEE 2020 – Jobs and Prosperity in a European Perspective', which the Regional Cooperation council (RCC) worked out upon the request of the Southeast Europe cooperation Process (SEECP) and the European Commission (EC) in 2013. Mobility is also highlighted in the Western Balkans Regional R&D Strategy for Innovation (Correa, 2013), published in the same year, where it is suggested that "reforms promoting the mobility of researchers, within the region and between the region and other countries, both in Europe and elsewhere … should be advanced" (p. 8) to assist with counteracting brain drain and promoting 'brain circulation'. The RCC commissioned a study published in 2016 to take stock of the situation with regards to the mobility of researchers in the Western Balkan economies (Cowey, 2016). Since then, different considerations have been pondered as to which measures could best support researcher mobility in the region as well as in exchange with the EU.

So far, recommendations for the further development of the scientific systems of the Southeast European region have attracted the most attention, which were made by the "Joint Science Conference" of the Austrian Academy of Sciences (ÖAW) and the National Academy of Sciences Leopoldina in the run-up to the Paris "3rd Western Balkans Summit" (2016) of the heads of state and government. Among others, it called for enhanced international mobility at all levels of the scientific careers in order to counteract the migration of qualified scientists abroad in the long term. In particular, a brain circulation scheme was demanded for junior scientists from the Western Balkan Countries to work at state-of-the-art institutions and companies abroad (Western Balkans Process/ Berlin Process, 2016). Since then, discussion with the EC are going on as regards the shaping and financing of such scheme(s).

The notion of mobility for international interaction purposes is not confined to the WB6. National R&D strategies for international cooperation from many European countries strongly push the idea of international mobility of researchers, based on the assumption that 'brain circulation' contributes to leveraging the quality of the top-end human capital and thus contributes to enhancement of excellence (Schuch, 2019a; SFIC 2018; Özbolat and Harrap, 2018; ERWATACH 2013; Schwaag Serger and Remoe, 2012; Boekholt et al. 2009; CREST, 2007). The justification for this claim stems to a large degree from the argument that the availability of qualified human capital belongs to the most important location factors for economies. The Western Balkan region, however, suffered from the migration of large numbers of scientists, engineers, and technicians for decades. With the exception of Croatia and Serbia, where some authors assume that these trends could be reversing (while others such as Vracic [2018] are opponent to this assessment), brain drain is likely to affect generations of young researchers, compromising research capacity in the longer term (World Bank, 2013). Governments in the region are aware of the challenges of brain drain and have undertaken a number of initiatives to address the issue (Varzari et al, 2013). Structured mobility schemes, which enable knowledge exchange and knowledge inclusion processes through non-permanent stays abroad are often considered as adequate tools for mitigating the integration challenge and to contribute rather to 'brain circulation' than 'brain loss'.

4. PARTICIPATION OF WB6 COUNTRIES IN CEEPUS

CEEPUS (Central European Exchange Programme for University Studies) is an important structured regional mobility programme to support academic mobility and cross-border cooperation between higher education institutions (HEI) in the region of Central and Southeast Europe (except Greece). At present, CEEPUS unites universities from 16 Central and Southeast European countries (Albania, Austria, Bosnia and Herzegovina, Bulgaria, Croatia, the Czech Republic, Hungary, Kosovo*[10], North Macedonia, Moldova, Montenegro, Poland, Romania, Serbia, the Slovak Republic and Slovenia) within networks consisting of at least three higher education institutions from at least two different CEEPUS treaty countries. Mobility of students and researchers[11] takes place primarily in the framework of such CEEPUS networks, which are competitively awarded through annual calls.

On average, a CEEPUS network consists of around 14 participating HEI (i.e. the so-called participations). CEEPUS cumulated 13,366 participations of HEI from the academic year 2005/2006 until 2019/2020 (see Tab. 1). An overview on the yearly development of the number of CEEPUS networks over time is provided in Schuch (2019b).

The highest share of participation has been achieved by Poland (1,490 or 11.15% of all participations in CEEPUS). Poland is positioned in a cluster of CEEPUS countries (plus Romania, Czech Republic, Slovakia and Hungary), whose universities frequently participate in CEEPUS networks. A second cluster consists of Croatia, Austria and Serbia (between 8.10% and 7.92% participation rate), followed by Slovenia (6.24%). The next cluster consists of Bulgaria, North Macedonia, Bosnia and Herzegovina (between 4.73% und 3.37%), followed by the CEEPUS countries Albania, Montenegro, Moldova and Kosovo*.

8 As of 2015, all candidate countries and potential candidates submit annual Economic Reform Programmes (ERPs) that mimic the European Semester process.

9 https://ec.europa.eu/research/iscp/index.cfm?pg=west_balk; accessed on 29 July 2020.

10 CEEPUS refers to the status of Kosovo according to UN Security Council Resolution 1244/99 in its Ministerial Conference as Prishtina et al.

11 CEEPUS uses the term ‚teachers' instead of 'researchers'. We equate the term 'teachers' in this study with ‚researchers', because CEEPUS does not limit the mobility of the non-student faculty to perform only teaching functions, but allows also conduct of research. In reality, there is a high degree of overlap.

Tab. 1: Participation in CEEPUS networks and ratio between network coordination and network participation differentiated by CEEPUS countries (sum of the academic years 2005/2006 until 2019/2020)

Country	Networks	in %	Ratio between coordination and participation
Albania	239	1.79	n.a.
Austria	1,068	7.99	1:6
Bosnia and Herzegovina	451	3.37	1:150
Bulgaria	632	4.73	1:14
Croatia	1,082	8.10	1:20
Czech Republic	1,397	10.45	1:17
Hungary	1,352	10.12	1:15
Kosovo*	105	0.79	n.a.
Moldova, Republic of	140	1.05	n.a.
Montenegro	228	1.71	1:46
North Macedonia, Republic of	512	3.83	1:512
Poland	1,490	11.15	1:13
Romania	1,420	10.62	1:13
Serbia	1,059	7.92	1:15
Slovakia	1,357	10.15	1:16
Slovenia	834	6.24	1:8
Grand Total	**13,366**	**100**	**1:14**

Source: Central CEEPUS Office; own calculations. Greece is not a CEEPUS country and thus excluded.

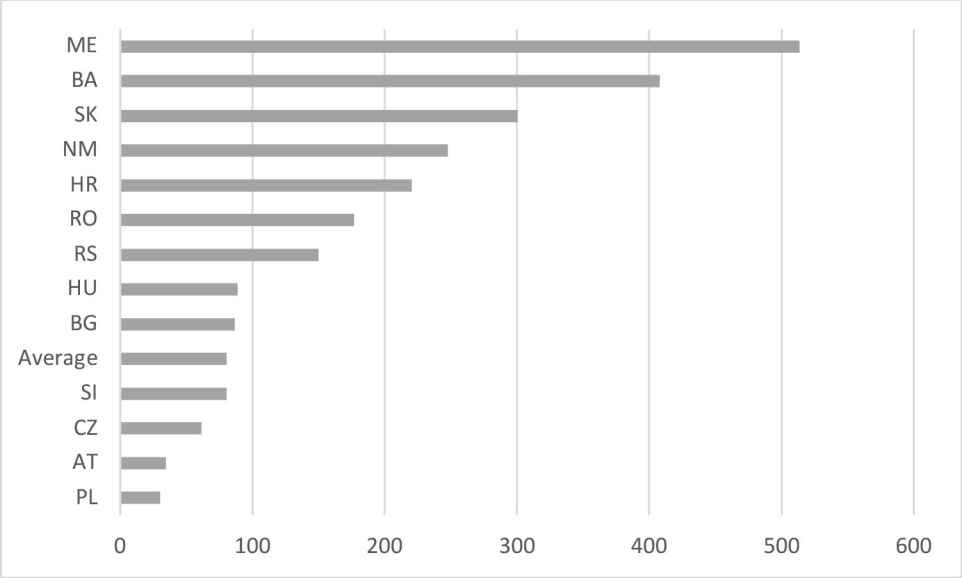
The participation numbers are of course also influenced by the number of HEIs existing in each single CEEPUS country and by the country's size in terms of population and human research capacity. This could also provide some explanation of the high participation rates of Poland and Romania[12], while in countries with a rather limited number of universities – like in Slovenia for instance – a certain degree of saturation is more easily achieved.

Most of the CEEPUS networks were coordinated by Austrian universities (no= 174), which had a central hub function especially in the first years of CEEPUS[13]. Frequent coordination was also performed by universities from Poland, Romania and Slovenia (between 113 and 104 coordinated networks). The next cluster consists of Hungary, Slovakia, the Czech Republic and – with some distance – Serbia (between 90 and 69 coordinated networks). This cluster is followed by Croatia (54) and Bulgaria (44), while the number of networks coordinated by HEI from Montenegro, Bosnia and Herzegovina and North Macedonia is comparatively very low (between 5 and 1). No coordination of CEEPUS networks from universities from Albania, Kosovo* and Moldova could be identified in the data records.

It is interesting to look at the ratio between coordination of networks and participation in networks by CEEPUS countries, because frequent coordination could indicate (i) a higher strategic ownership, (ii) available functional network management capacities and/or (iii) some kind of (attributed or self-imposed) leadership attribution. As shown in Tab. 1 we can identify striking differences between the CEEPUS member countries in this respect. On average the CEEPUS countries have a ratio of around 1 coordination : 14 participations, which means that out of 14 network participations of a country one participation is in the role of an overall network coordination. The countries close to average are Bulgaria, Hungary, Poland, Romania, Serbia, Slovakia and the Czech Republic. Austria and Slovenia, however, have relatively more overall network coordinations than participations. In contrast are Albania, Kosovo*, Moldova, North Macedonia and Bosnia and Herzegovina. This latter group of countries is either less integrated in international cooperation, or these countries lack the necessary functional network management capacities and/or have less international creditability. This indicates structural problems, which have to be addressed primarily by domestic policies.

12 Although Romania, for instance, has only half the number of R&D personnel than Austria.
13 And few of these early networks are still in operation.

Fig. 1: Sum of inward + outward mobility in CEEPUS by 1,000 R&D personnel



Note: own calculations; R&D personnel in FTE (2018) taken from EUROSTAT (only latest available data for Bosnia and Herzegovina is from 2014).[14] Albania, Moldova and Kosovo* are excluded.

Fig. 1 shows the sum of inward and outward mobility by 1,000 R&D personnel. If we normalise the CEEPUS participation data to get rid of size effects, one can compute the number of participations relative to the country's R&D capacity (expressed as R&D personnel in full-time equivalents [FTE] taken from Eurostat). Fig. 1 clearly shows that countries with lower R&D capacity benefit a lot from CEEPUS. Especially Montenegro and Bosnia-Herzegovina have a very high, above average relative participation. This would probably also be true for Kosovo*, Albania and Moldova, if FTE researcher data were available. In addition, Slovakia, North Macedonia, Croatia, Romania and Serbia have a high above average relative participation. On the other hand, Tab. 2 also shows that the countries with the highest R&D capacity (expressed in R&D personnel in FTE), have a comparatively low relative participation (Poland, Austria, Czech Republic). The remaining countries are close to the average.

Alongside the almost 25,000 students, 20,010 researchers have also participated in mobility schemes within the CEEPUS networks since the 2005/2006 academic year (data of previous years were not available) (see Tab. 2). Thus, the number of researchers' mobility was almost as frequent as the number of students' mobility, which confirms the dual use of CEEPUS for the benefit of students and researchers.

As shown in Tab. 2, the countries with the highest numbers of outgoing researchers were Slovakia (3,146), Romania (2,647), Poland (2,599), Hungary (2,119), Serbia (2,113) and the Czech Republic (1,940). A 'middle' group consists of Croatia (1,346), Austria (1,120), and Bulgaria (1,049) followed with some distance by Slovenia (784). The highest number of incoming researchers went to Romania (2,998), Slovakia (2,945), and the Czech Republic (2,668), followed with some distance by Poland (2,290), Hungary (1,939), Austria (1,692) and Croatia (1,529).

The incoming/outgoing balance can also be seen as an indication for the attractiveness of a country's research system if we assume that researchers tend to go there where the better working conditions are. The Czech Republic for instance has received 738 researchers more than sent abroad (see Tab. 2) and its incoming/outgoing ratio is 1.38:1. This value is only surpassed by Austria (1.51:1) and Kosovo* (1.75:1).

However, the high incoming/outgoing value of Kosovo* but also the low levels of for instance Slovenia and Poland show the weaknesses of a too uncritical use of this indicator as proxy for 'locational R&D attractiveness': the value for Kosovo*, for instance, is partly a statistical artefact caused by low absolute mobility numbers, but can also be partly explained by a considerable number of expatriates who use the opportunity to temporarily return to Kosovo*. Slovenia, which has a more competitive R&D system compared to the WB6, seems rather to be limited by its absolute low number of researchers and the relative low number of universities in the country, while in the case of Poland, for instance, size effects seem to matter. Poland attracted 2,290 researchers from the CEEPUS region during 2005/2006 until 2019/2020, which is the fourth highest value among the CEEPUS countries. This number of incoming researchers to Poland is also considerably higher than the number of researchers coming to Austria (1,692), but Poland also has a higher number of universities and researchers, which use CEEPUS for outgoing mobility (2,599).

Fig. 2 shows the incoming/outgoing imbalances of the scrutinised CEEPUS countries. Countries with a high imbalance skewed towards higher outgoing than incoming researchers' mobility are first of all Serbia, followed by Slovenia, Moldova and then Poland and North Macedonia.

As shown in Tab. 2, we can generalise that the pervasion of CEEPUS and, thus, its relative importance, is comparatively high in the WB6, which is shown clearly by the above-average relative participation figures and the strong cross-country mobility exchanges within the region. This points somehow to the heritage of the former Yugoslavia with still existing relations in the field of higher education and research, some shared cultural overlaps and a similar language space.

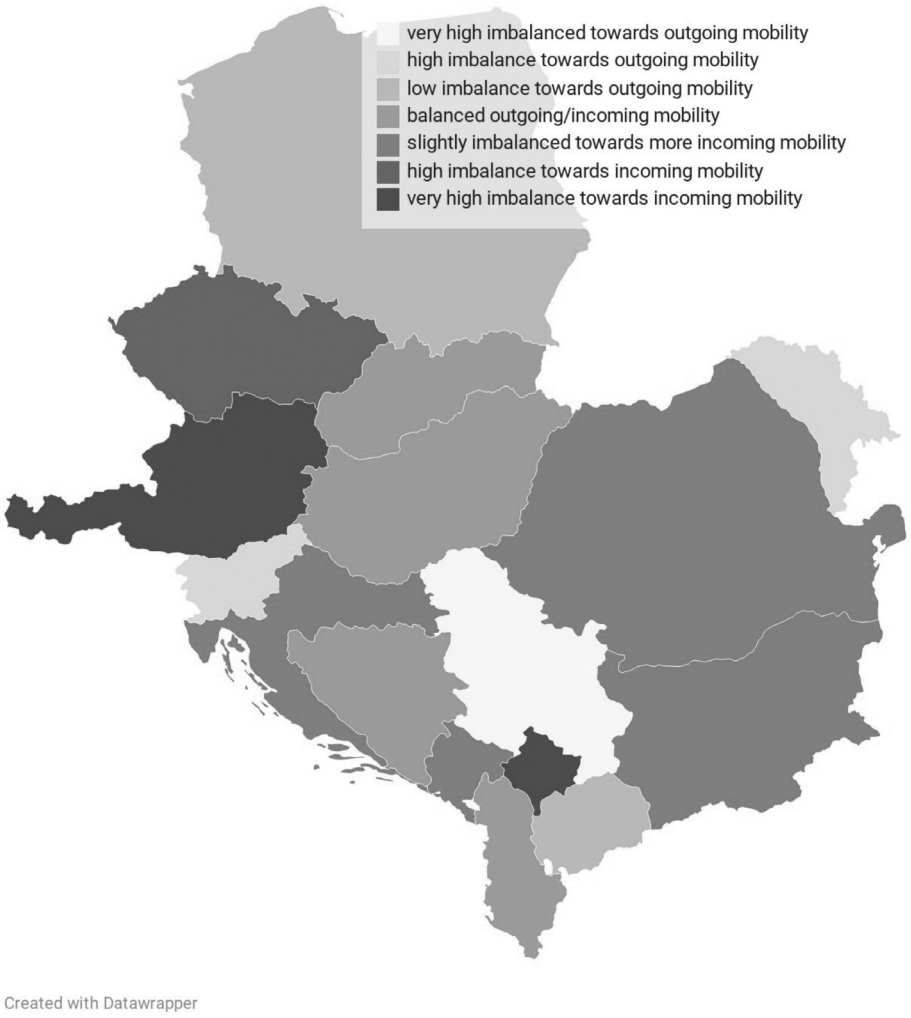
14 https://ec.europa.eu/eurostat/web/products-datasets/product?code=rd_p_perssci; accessed on 31 July 2020.

Tab. 2: Incoming and outgoing teachers within CEEPUS networks since the academic years 2005/2006 until 2019/2020 differentiated by countries (without freemovers)

Person Count	INCOMING TO																
OUT-GOING	AL	AT	BA	BG	CZ	HR	HU	MD	ME	NM	PL	RO	RS	SI	SK	XZ	Grand Total	Balance
AL outg.		24	2	7	7	15	25		4		16	15	4	9	12	9	149	-7
AT outg.	32		18	121	109	104	143	3	12	10	133	177	65	39	120	34	1120	572
BA outg.	1	37		21	27	53	4		16	4	5	24	113	28	15	1	349	23
BG outg.	7	115	16		136	48	83	13	30	29	123	220	66	23	123	17	1049	134
CZ outg.	6	137	12	103		247	149	10	27	11	351	247	54	36	548	2	1940	728
HR outg.	12	152	71	46	300		117	1	11	24	175	112	91	77	147	10	1346	183
HU outg.	15	271	9	48	219	123	2	3	5	12	255	571	139	37	408	2	2119	-180
MD outg.		6		20	18	3	3		2	5	37	125	1	1	17		238	-91
ME outg.	1	8	8	9	16	13	4	1		2	2	8	11	2	6		91	179
NM outg.T	2	33	9	36	28	33	15		15		11	14	22	18	22	3	261	-28
PL outg.	26	219	5	186	516	205	212	32	55	20		372	71	42	618	20	2599	-309
RO out	14	254	16	218	323	154	506	79	19	35	335		129	26	538	1	2647	351
RS outg.	6	145	174	169	171	172	294	2	31	28	109	418		84	310		2113	-1094
SI outg.	5	135	29	29	84	126	62	2	9	36	56	34	117		57	3	784	-304
SK outg.	13	141	3	156	711	224	317	1	34	16	677	660	136	56		1	3146	-201
XZ outg.	2	15		14	3	9	3			1	5	1		2	4		59	44
Grand Total	**142**	**1692**	**372**	**1183**	**2668**	**1529**	**1939**	**147**	**270**	**233**	**2290**	**2998**	**1019**	**480**	**2945**	**103**	**20010**	**0**

Source: Central CEEPUS Office; own calculations

Fig. 2: Incoming/outgoing mobility imbalance of teachers within CEEPUS networks since the academic years 2005/2006 until 2019/2020 differentiated by countries



Source: Central CEEPUS Office; own calculations. Map created with datawrapper.

In addition to the mobility exchange within the CEEPUS networks, also more than 6,500 so called free-movers based on Art. 2, para 6 of the CEEPUS-3 treaty, were supported since the 2005/2006 academic year. Thus, in total, around 1,571 researchers and 2,106 students (both inclusive free-movers) have gained mobility experiences per academic year from 2005/2006 to 2018/2019 at average, which is an impressive number.

5. PARTICIPATION OF WB6 COUNTRIES IN ERASMUS+

ERASMUS+ is the EU's major programme to support education, training, youth and sport in Europe. Its budget of €14.7 billion (2014-2020) provides opportunities for over 4 million Europeans (of which around 2 million are students and around 800,000 are lecturers, teachers, trainers, and education staff as well as youth workers[15]) to study, train, and gain experience abroad. The aim of ERASMUS+ is to contribute to the Europe 2020 strategy for growth, jobs, social equity and inclusion, as well as the aims of the EU's strategic framework for education and training.[16]

15 The others are mainly pupils and apprentices.
16 Information taken from https://ec.europa.eu/programmes/erasmus-plus/, accessed on 23 April 2019.

The eligible countries for ERASMUS+ are divided into Programme countries and Partner countries. Programme countries are eligible for all actions of ERASMUS+, while Partner countries can only take part in some, and are subject to specific conditions. All 28 EU Member States as well as North Macedonia and Serbia[17] are Programme countries. Albania, Bosnia and Herzegovina, Kosovo* and Montenegro are Partner countries.[18]

ERASMUS+ is a powerful programme even if only the field of higher education, as in this paper, is concerned. Tab. 3 shows the number of outgoing staff members[19] from ERASMUS+ Programme countries from the wider region in the period from 2014/15 to 2017/18. From these countries, around 51,000 staff members were going to other countries in these four years. The total incoming figure is lower: almost 45,000 staff members went to the selected countries within the four years under scrutiny. Negative balances (incoming minus outgoing) are observable for Bulgaria, Hungary, Romania and Slovenia. North Macedonia is the only WBC6 country for which corresponding data were provided in the factsheets published by the European Commission.

Tab. 3: Participation of selected ERASMUS+ programme countries from the wider region in ERASMUS+ (2014/15 – 2017/18) differentiated by outgoing and incoming staff

2014/2015 - 2017/2018					
	Outgoing staff	**Incoming staff**	**Balance of staff (incoming minus outgoing)**	**Total R&D personnel in HES 2017 (headcount)**	**Outgoing staff in % of R&D Personnel in the HES (headcount) 2017**
Austria	6.557	6.890	333	48.363	13,56
Bulgaria	6.662	4.074	-2.588	9.287	71,73
Croatia	3.161	3.921	760	11.386	27,76
Greece	5750	7147	1397	45.206	12,71
Hungary	9.620	8.580	-1.040	23.816	40,39
North Macedonia	269	807	538	2.853	9,43
Romania	15.829	9.924	-5.905	19.101	82,87
Slovenia	3.400	3.254	-146	5.212	65,23
Sum	**51.248**	**44.597**	**-6.651**	**165.224**	**31,02**

Source: country factsheets 2018 published in January 2020 at https://ec.europa.eu/programmes/erasmus-plus/about/factsheets_en; accessed on 3 August 2020; EUROSTAT data on R&D personnel; accessed on 3 August 2020; own calculations.
[a] Data for Serbia was not available, because it became a Programme country on 5th February 2019.

Although the ERASMUS+ statistics use a different definition for staff than R&D personnel according to OECD/Eurostat, the ration of mobility figures vis-a-vis R&D personnel in the Higher Education Sector (HES) in headcount (2017) shown in Tab. 3 gives a first rough approximation about how intensively ERASMUS+ was used for exchange of HES personnel. By deliberately ignoring – but not forgetting - this haziness in definition one could estimate with caution that at average roughly around a fourth to a third[20] of R&D personnel from the CEEPUS countries were making use of ERASMUS+ (outgoing only) between 2014 and 2017. Although the comparability used here is limited, not at least because some teachers may use ERASMUS+ several times, the leverage effect of Erasmus+ on personnel exchange can be considered as very high in general. North Macedonia, however, is the exception in this picture.

17 Serbia became Programme country on 5th February 2019.
18 Information taken from https://ec.europa.eu/programmes/erasmus-plus/, accessed on 23 April 2019.
19 Please take note that the definition of "staff" differs between CEEPUS and ERASMUS+.
20 One should also bear in mind that one and the same person can have more than just 1 mobility grant in the three academic years under scrutiny (2014/15 - 2016/17) and that staff in ERASMUS+ includes also administrative personnel.

Tab. 4: Participation of WB6 countries in ERASMUS+ (2015-2019) differentiated by outgoing and incoming students/staff

	Outgoing students and staff (2015-2019)	Incoming students and staff (2015-2019)	Balance
Albania	5.552	3.281	-2.271
Bosnia and Herzegovina	5.885	3.562	-2.323
Kosovo*	2.771	1.418	-1.353
Montenegro	2.008	1.188	-820
North Macedonia	1.359	1.173	-186
Serbia	6.913	4.319	-2.594
Sum	**23.129**	**13.786**	**-9.361**

Source: country factsheets published at https://ec.europa.eu/programmes/erasmus-plus/about/factsheets_en; accessed on 3 August 2020; own calculations

Since similar detailed data were not available for WB6 countries, which were only ERASMUS+ Partner countries until 2019, Tab. 4 summarises basic information about the use of ERASMUS+ for WB6 countries with aggregated data from 2015 to 2019. Unfortunately, the source of these data does not allow a differentiation between students and staff. By taking the distribution between students and staff of those countries into account, which are ERASMUS+ Programme countries, we would estimate that the ratio of students and staff is around 3 : 1. From 2015 to 2018 more than 23,000 students and staff members from Albania, Bosnia and Herzegovina, Kosovo*, Montenegro, North Macedonia and Serbia went to other ERASMUS+ countries. During the same period, these countries received almost 14,000 incoming students or staff. The balance between incoming and outgoing is clearly negative in these countries.

Unfortunately, the ERASMUS+ country sheets do not provide information about the countries of origin for incoming students/staff nor they provide information about the destination for outgoing students/staff. Schuch (2019) shows that there are pronounced mobility patterns within the region with regard to the regional neighboring countries, which are also CEEPUS countries, and for which sufficient data is available because they are ERASMUS + programme countries. There are for instance strong outgoing staff ERASMUS+ mobility streams from Croatia to Slovenia and vice-versa as well as from North Macedonia to Slovenia. It is quite likely that the WB6 ERASMUS+ partner countries use the programme also to a good deal for mobility within the wider region. It is for instance known that the top receiving countries within ERASMUS+ for outgoing mobility from North Macedonia are Turkey, Croatia and Bulgaria.[21]

6. PARTICIPATION OF WB6 COUNTRIES IN MARIE SKŁODOWSKA-CURIE ACTIONS

Within Europe's R&D programme Horizon 2020, the Marie Skłodowska-Curie Actions (MSCA) provide several sub-instruments that support structured researcher mobility[22]:

1. **Co-funding of regional, national and international programmes that finance fellowships involving mobility to or from another country (COFUND)**: COFUND offers additional funding to regional, national and international programmes for research training and career development. The scheme can support doctoral and fellowship programmes.
2. **Individual Fellowship (IF)**: IF supports the mobility of researchers within and beyond Europe to attract the best foreign researchers to work in the EU.
3. **International Training Network (ITN)**: ITNs support competitively selected joint research training and/or doctoral programmes, implemented by European partnerships of universities, research institutions, and non-academic organisations.
4. **International and inter-sectoral cooperation through the Research and Innovation Staff Exchanges (RISE)**: RISE supports short-term mobility of research and innovation staff at all career levels, from the most junior (post-graduate) to the most senior (management), including also administrative and technical staff. It is open to partnerships of universities, research institutions, and non-academic organisations both within and beyond Europe.
5. **The European Researchers' Night (NIGHT)**: It is a Europe-wide public event to stimulate interest in research careers, especially among young people (NIGHT is not considered in this analysis).

21 This information is available in the ERASMUS+ country factsheet of North Macedonia. https://ec.europa.eu/programmes/erasmus-plus/about/factsheets_en; accessed on 7 August 2020.

22 Definitions taken from https://ec.europa.eu/programmes/horizon2020/en/h2020-section/marie-sklodowska-curie-actions; accessed on 31 July 2020.

Data in Tab. 5 show several interesting aspects:

If we take the wider region as reference, we first see that participation in MSCA is uneven. We can distinguish the following clusters:

a) Greece and Austria have the highest mobility numbers (and corresponding funding inflow). Country size factors and research capacity factors influence these numbers.
b) In the second cluster we find a number of mid-sized "new" member states, namely Romania, Hungary, and Bulgaria, and the smaller-sized Slovenia as well as Serbia and Croatia; i.e. the most involved countries from the formerly so called "Western Balkan" region.
c) All other WB6 show considerably lower involvement rates.

Secondly, among the entire wider region only Austria has a positive inward-outward balance. All the other countries (except Kosovo*, which is statistically not significant due to the very low absolute numbers) show more outgoing than incoming researchers. When considering the broad geographical coverage of MSCA with its focus on the entire EU, but also beyond, it seems that based on this indicator[23] only Austria is an attractive research location.

Third, the MSCA country profiles published by the EC show also data differentiated by gender. From these data we can conclude that the mobility offers under MSCA are above average used by female researchers from the WB6. Austria, by contrast, has a distinct surplus of mobile male researchers. The share of male researchers in MSCA actions is also considerably higher in Greece and Hungary. All other countries are close to a balanced participation in terms of gender.

Tab. 5: Participation, success rates, networks and EU contribution received in MSCA by WBC6 and countries of the wider region

Countries	No. of domestic re-searchers funded by MSCA (2014-2019)	No. of re-searchers going to …	Inward-outward difference	EU contribution to domestic organisations (in mio. €)	Share of female researchers involved in MSCA actions in %	Success rate in % (no of funded projects div. by no. of submitted projects *100)
AL	32	4	-28	0,08	63	9,09
AT	322	808	486	123,81	36	13,55
BA	41	10	-31	0,98	54	25,00
BG	169	125	-44	6,83	49	18,83
GR	1397	868	-529	77,37	42	12,37
HR	158	59	-99	7,46	47	10,62
HU	244	105	-139	17,90	43	9,82
ME	12	0	-12	0,08	67	11,54
NM	30	4	-26	0,28	67	5,26
RO	346	147	-199	12,22	52	13,38
RS	246	61	-185	7,76	58	15,54
SL	199	160	-39	17,87	45	7,86
XK	3	4	1	N/A	100	6,67
Total	**3199**	**2355**	**-844**	**272,64**	**56**	**12,27**

Source: data published in country sheets by EC: https://ec.europa.eu/research/mariecurieactions/msca-numbers_en. Last refresh date: 25/11/2019. R&D personnel in FTE (2018) taken from EUROSTAT (only latest available data for Bosnia and Herzegovina is from 2014).[24]

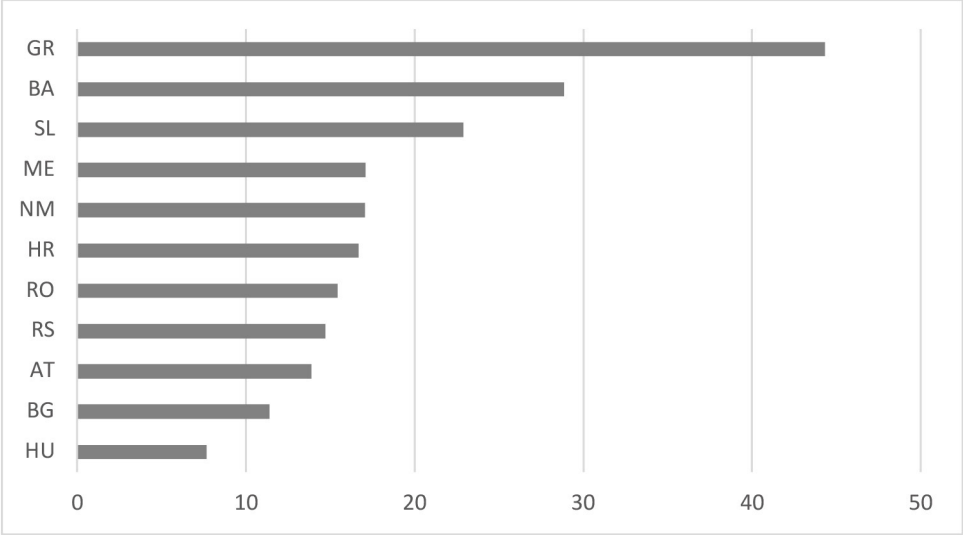
23 We have already noted before that this is a too simple interpretation of this indicator. Greece or Slovenia, for instance, are also known for several pockets of excellence on their territory.

24 https://ec.europa.eu/eurostat/web/products-datasets/product?code=rd_p_perssci; accessed on 31 July 2020.

Fourth, we observe very large differences as regards the MSCA success rates between the countries. The average success rate in MSCA among the EU Member States is 12.71%, among the Associated Countries 12.38% and among the Third Countries 19.04%. Considerably higher success rates have been achieved by Bosnia and Herzegovina and Bulgaria and considerably lower ones by Slovenia, North Macedonia, and Kosovo*. All the other countries from the wider region meander around the average rates.

If we relate the sum of inward and outward mobility of each country to its capacity approximated by the number of R&D personnel in full-time equivalents, then we can see in Fig. 3 that Greece, Bosnia and Herzegovina and Slovenia are those countries from the wider region, which relatively make the most efficient use of MSCA. They are followed by Montenegro, North Macedonia and Croatia. In relation to its number of R&D personnel in full-time equivalents, especially Hungary is positioned on the other side of the spectrum.

Fig. 3: Sum of inward + outward mobility in MSCA by 1,000 R&D personnel



Note: own calculations; R&D personnel in FTE (2018) taken from EUROSTAT (only latest available data for Bosnia and Herzegovina is from 2014).[25] Albania, Moldova and Kosovo* are excluded.

Albania, Bosnia and Herzegovina, Croatia, Greece, Hungary, North Macedonia, Romania, and Slovenia list Austria among their 10 top destination countries in MSCA. If we look on the origin of inward mobility of researchers to the WB6 we can identify a different picture.[26] The regional component is much more expressed. This is especially true for Bosnia and Herzegovina and Croatia where 3 out of 10 top countries for incoming MSCA mobility are from the scrutinised wider neighbourhood region. Despite the expressed EU-wide claim of MSCA, for several of the countries examined, the regional cooperation component is important and accordingly in demand too.

Overall we can conclude that the MSCA could be especially for PhD students and post-docs partially an alternative to the other scrutinised structured mobility programmes, although it is one of the most competitive sub-programmes in Horizon 2020. The absolute participation numbers are still marginal in the smaller WB6, which is mostly caused by their limited capacities. Within these limited absorption capacities, however, the WB6 are doing quite well as regards the use of MSCA, especially in comparison to the scrutinised Central European countries. The overall claim raised by some politicians from the EU-13 that the European Framework Programme for RTD is made for those ('old' or Western) EU countries, which have stronger R&I systems in place, needs to be challenged. Countries show their own individual patterns and generalisations and assignments of guilt do not match the reality (as already argued by a number of other studies such as Quaglio et al. (2020), Pazour et al. (2018), Ukrainiski et al. (2018a), Ukrainiski et al (2018b), Harrap and Doussineau (2017), Makkonen and Mitze (2016), MIRRIS (2016), Schuch (2014) and Schuch (2005)). The comparatively lower income attractiveness, however, remains a striking problem among all the scrutinised countries (with the exception of Austria), which can probably only be solved in the long run by considerable more investments in R&I infrastructures and increasing salaries.

25 https://ec.europa.eu/eurostat/web/products-datasets/product?code=rd_p_perssci; accessed on 31 July 2020.
26 Data published in country sheets by EC: https://ec.europa.eu/research/mariecurieactions/msca-numbers_en. Last refresh date: 25/11/2019

7. PARTICIPATION OF WB6 COUNTRIES IN COST ACTIONS

COST is the oldest established European research programme and contributes actively to the 'Spreading Excellence and Widening Participation' goal of HORIZON 2020 with a strong focus on the so called COST Inclusiveness Target Countries (ITC). The ITC subsume the EU Member States and countries associated to HORIZON 2020 less developed in terms of research and innovation. COST has 39 member states including all WB6 countries with exception of Kosovo* which is not a COST member. Half of COST's total budget should be of direct benefit to the ITC. A strong focus is on the inclusion of early-stage researchers.

The COST programme funds thematic networks, which enable cooperation among scientists and researchers (including early-stage career researchers) across Europe. COST is 'bottom-up' and funds thematic networks in all research areas. Scientists and researchers can participate in science and technology networks known as COST Actions through either being part of a new proposal or joining an existing COST Action. COST Actions are basically networking instruments with a strong training component to co-operate and co-ordinate nationally-funded research activities. COST, however, does not fund research itself.

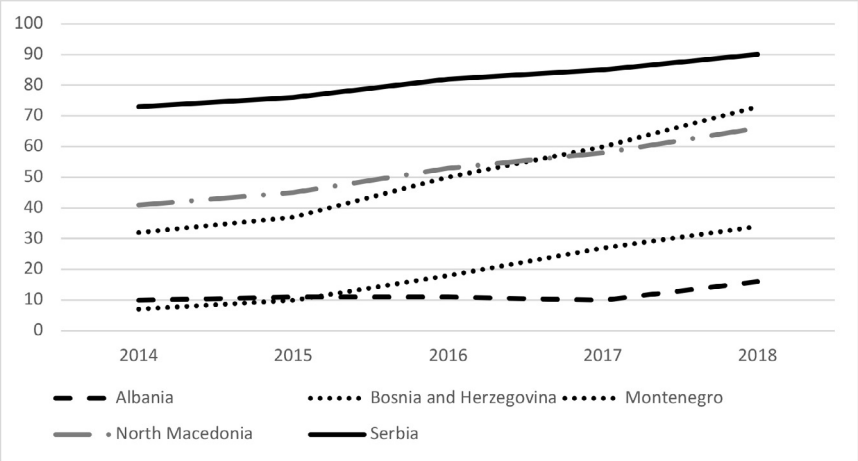
Tab. 6: Participation of WB6 countries except Kosovo*and comparison countries from the neighbourhood in running COST actions in 2019 and 2018

Countries	2019				2018	
	Participations	Chairs	Vice-chairs	Participations	Chairs	Vice-chairs
Greece	285	6	14	285	3	15
Serbia	271	1	6	261	0	3
Croatia	270	1	7	260	3	6
Slovenia	248	4	3	236	1	4
Romania	244	0	3	237	0	2
Austria	243	11	4	247	8	7
Bosnia and Herzegovina	240	1	0	207	1	1
Hungary	227	1	6	223	1	4
Bulgaria	218	0	0	197	0	0
North Macedonia	210	1	2	188	0	3
Montenegro	121	0	0	92	0	0
Albania	105	0	0	27	0	0

Source: Data from COST (2020) Annual Report 2019, and from COST (2019) Annual Report 2018.

Tab. 6 shows the participation of WB6 and the comparison countries form the wider region in the 294 running COST actions in 2019 respectively the 291 running COST actions in 2018. The high involvement of WB6 is visible. Serbia and Croatia are within the first quartile of all COST member countries in terms of participation in running COST actions (COST, 2020). Bosnia and Herzegovina and North Macedonia are in the 3rd quartile. Only Montenegro and Albania have comparatively lower participation numbers, which is partly caused by the size of their research capacities.

Fig. 4: WB6 country representation in % of all running COST actions from 2014-2018 (except Kosovo*)



Source: COST (2020b). Country Fact Sheet; https://www.cost.eu/wp-content/uploads/2020/07/COST-Country-Fact-Sheets-2018.pdf

However, as regards the number of chairs and vice-chairs, which is a proxy for recognition for scientific leadership, all WB6 score very low. Chairs of COST actions are still to a very large extent from the 'old' EU Member States (i.e. the so-called EU-15), in particular Italy, Spain, UK, Germany, France and the Netherlands (COST, 2020). The same is true for the co-chairs, who come from institutions located in UK, Italy, Spain, France, Germany and Portugal (COST, 2020).

Fig. 4 shows the development of representation of researchers from WB6 (expect Kosovo) in COST actions from 2014 to 2018 taken from COST (2020b). The results clearly demonstrate that COST fulfils its intention to 'spreading excellence and widening participation', because more and more partners from the so called widening countries participate in the programme.[27] The WB6 countries, which are COST members, clearly increased their participation in COST over time. Also Montenegro and Albania, the countries with the lowest overall participation numbers, show an observable increase in participation, too.

As highlighted in Tab. 7 participation of researchers from the countries under scrutiny differentiated by gender show very uneven patterns, although there is a balance with regard to the entire study region, because the countries with a high surplus of men (Austria and Hungary) balance each other out with the countries with a positive surplus of women (especially Albania; but also Bulgaria and Serbia). In general, all WB6, expect North Macedonia show a tendency towards higher female participation in COST action initiatives in 2019. The situation in North Macedonia is statistically very balanced.

Tab. 7: Individual participation in all COST action initiatives by gender in 2019

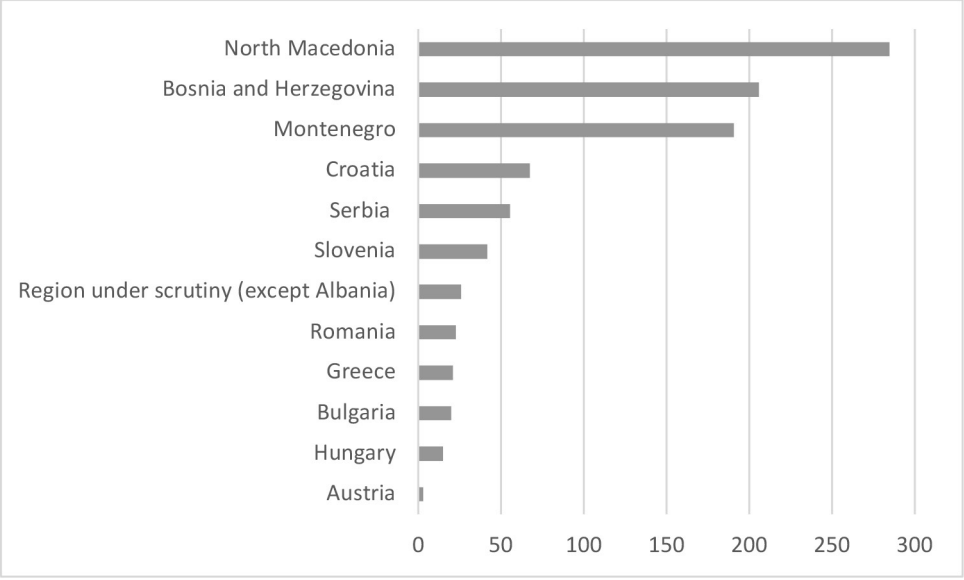
Countries	Women	Men	Both Total	Gender balance
Albania	**36**	**16**	**52**	**very unbalanced**
Austria	286	491	777	very unbalanced
Bosnia-Herzegovina	**194**	**170**	**364**	**balanced**
Bulgaria	289	221	510	slightly skewed
Croatia	469	412	881	balanced
Greece	467	604	1071	slightly skewed
Hungary	243	444	687	very unbalanced
Montenegro	**73**	**61**	**134**	**balanced**
North Macedonia	**283**	**285**	**568**	**balanced**
Romania	386	336	722	balanced
Serbia	**676**	**483**	**1159**	**slightly skewed**
Slovenia	308	350	658	balanced
Region under scrutiny	**3710**	**3873**	**7583**	**balanced**

Source: Data from COST (2020) Annual Report 2019; own calculations

27 In our case this observation is however limited to the scrutinised Western Balkan countries, because we did not look at all so called widening countries.

Fig. 5 shows that in relation to the available research capacity (approximated by the number of R&D personnel in full-time equivalents), COST is comparatively most intensively used by North Macedonia, Bosnia and Herzegovina and Montenegro, followed with considerable distance by a second cluster consisting of Croatia, Serbia and Slovenia. We can therefore draw the conclusion with some certainty that COST is a popular networking programme for the WB6 countries (even if the data for Albania and Kosovo are not available). Unfortunately, the data tells us nothing about the associated geographic mobility flows.

Fig. 5: Individual participation of researchers in COST actions 2019 differentiated by country per 1000 R&D personnel



Source: Data from COSTS (2019) Annual Report 2018. FTE of researchers (2018) are taken from EUROSTAT.[28]

8. SUMMARY AND CONCLUSIONS

1. The inclusion and participation of WB6 researchers in major structured regional and European mobility and training support programmes can be overall qualified as a success. Over the last 25 years, CEEPUS has had a great impact on capacity development in the field of higher education in Central and Southeast Europe. ERASMUS+ is also intensively used by the WB6 and participation in COST has increased remarkably. This trend should continue if all WB6 become ERASMUS+ Programme Members and if COST can maintain or even enlarge its functionality, scope and size in Horizon Europe.
2. CEEPUS is actively utilised by all CEEPUS countries, including the WB6 economies[29] and there are no obvious outsiders. The ratio between the country with the lowest network participation (Kosovo*) and the country with the highest network participation (Poland) is only 1:14. The use of CEEPUS thus confirms a rather compact pattern given the very different sizes and R&D capacities of the CEEPUS member countries. Participation patterns in CEEPUS also show that within CEEPUS *"no one has been left behind"*. The number of researcher's mobility was almost as frequent as the number of students' mobility, which confirms the dual use of CEEPUS for the benefit of students and researchers.
3. If we consider network coordination as a proxy for a higher level of integration into academic internationalisation processes, than Albania, Kosovo*, Moldova, North Macedonia and Bosnia and Herzegovina, seem to be still less vertically (or hierarchically) integrated in international cooperation, which could refer back to issues such as lack of available functional network management capacities or less international creditability. These lower levels of hierarchical integration, which we also observe for instance in the assumption of management functions in the COST programme, indicate structural problems, but could also be a typical feature of the *'stairway to integration'*.
4. Another issue that points to structural weaknesses is the incoming-outgoing ratio of researchers within the scrutinised mobility programmes. In CEEPUS, for instance, countries with a high imbalance skewed towards higher outgoing than incoming

28 https://ec.europa.eu/eurostat/web/products-datasets/product?code=rd_p_perssci; accessed on 31 July 2020.
29 Albania, Bosnia and Herzegowina, Kosovo*, Montenegro, North Macedonia and Serbia.

researchers' mobility are first of all Serbia, followed by Slovenia, Moldova and then Poland and North Macedonia.

5. The participation numbers are of course also influenced by the number of higher education institutions existing in each single country and by the country's size in terms of population and research capacity. If we normalise the CEEPUS participation data to get rid of size effects, for instance by relating the number of participations measured in terms of incoming and outgoing researchers of a country with its R&D capacity (expressed in R&D personnel in full-time equivalents [FTE]), we see that Montenegro and Bosnia-Herzegovina, Slovakia, North Macedonia, Croatia, Romania and Serbia have a high above average relative participation in CEEPUS. We can further generalise that the pervasion of CEEPUS and, thus, its relative importance, is comparatively high in the Western Balkans region. This points somehow to the heritage of the former Yugoslavia with still existing relations in the field of higher education and research, some shared cultural overlaps and a similar language space. Unfortunately, the accessible ERASMUS+ country sheets do not provide information about the countries of origin from incoming students/staff nor do they provide information about the destination for outgoing students/staff. But there are indications (Schuch, 2019) of strong outgoing staff ERASMUS+ mobility streams from Croatia to Slovenia and vice-versa as well as from North Macedonia to Slovenia. It is quite likely that the WB6 ERASMUS+ partner countries use the programme also to a good deal for mobility within the wider region.
6. While both CEEPUS and ERASMUS+ are strongly used by students and researchers from the WB6, the situation as regards the Marie Skłodowska-Curie Actions (MSCA) looks different. Although Serbia has participation numbers comparable with Croatia, Romania, Hungary, and Bulgaria, as well as the smaller-sized Slovenia, all other WB6 show considerably lower involvement rates. Moreover, among the entire wider neighbourhood region analysed, only Austria has a positive incoming-outgoing balance. All the other countries (except Kosovo*) show more outgoing than incoming researchers. A positive or balanced inward-outward balance is usually an indication of an attractive research location. If we look on the origin of inward mobility of researchers to the WB6 we can identify a strong regional component also in MSCA. This is especially true for Bosnia and Herzegovina and Croatia where three out of 10 top countries for incoming MSCA mobility are from the scrutinised wider neighbourhood region. Therefore, we can conclude from this observation that despite the expressed EU-wide claim of MSCA, the regional cooperation component is important too and accordingly in demand for several of the countries examined.
7. MSCA is one of the most competitive sub-programmes in Horizon 2020. The absolute participation numbers are still very marginal in the smaller WB6, which, however, is mostly caused by their limited capacities. Within these limited absorption capacities, however, the WB6 are doing quite well as regards the use of MSCA, especially in comparison to the scrutinised Central European countries. The comparatively lower income attractiveness, however, remains a striking problem, which most probably can only be solved in the long run by considerably more investment in R&I infrastructures and increasing salaries.
8. The WB6 are very well integrated into COST actions. Serbia and Croatia are within the first quartile of all COST member countries in terms of participation in running COST actions (COST, 2020). Bosnia and Herzegovina and North Macedonia are in the 3rd quartile. Only Montenegro and Albania have comparatively lower but remarkably rising participation numbers, which is partly caused by the size of their research capacities. Overall, we can conclude with some certainty that COST is a popular networking programme for the WB6 countries (even if the data for Albania and Kosovo are not available). Unfortunately, the published data tells us nothing about the associated geographic mobility flows.
9. As regards the gender distribution, we can see differences among the scrutinised countries, but usually WB6 participation of females in structured mobility-based training programmes is higher than for men.

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AUTHOR

KLAUS SCHUCH
ZSI – Centre for Social Innovation, Austria
Linke Wienzeile 246, 1150 Wien
E: schuch@zsi.at
ORCID: 0000-0002-7603-4384

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FTEVAL WORKING GROUP ON IMPACT DIMENSIONS OF R&I POLICY BEYOND SCIENTIFIC IMPACT

In summer 2020 the fteval community launched three internal working groups for capturing the state of the art of assessment of social impacts influenced or effected by R&I policy. International developments of social impact pathways of R&I were screened and reflected against the Austrian context. The working groups comprised more than 45 representatives of the fteval member organisations including funding agencies, research institutions, consultancies, ministries, and also the *Verein ScienceCenter-Netzwerk*.

The three groups analysed specific aspects of the impact of R&I and R&I policy on social innovations, on science-society relations and on a sustainable "green" economy. They were led by Joanneum Research, the OIS Center at Ludwig Boltzmann Gesellschaft and the Austrian Institute for SME Research. The results of the three groups were published in web-post format and can be viewed on the fteval website: https://fteval.at/content/home/news/ag_impact_results/

Nurtured by further elaboration, these results were developed into articles that reflect the context more deeply and link to the relevant discourses. The concrete measures proposed by the three groups have the potential to unfold the understanding of the role that R&I policies can play in the Austrian context and beyond. By publishing the results, we hope to support the development towards a shared understanding on the assessment of social impact of R&I policies, and therefore further fuel the debate among policy makers in research, technology and innovation but also individual evaluators.

practice paper

UMWELTWIRKUNGEN VON FTI-POLITISCHEN MASSNAHMEN: HERAUSFORDERUNGEN UND ANSÄTZE FÜR DIE EVALUIERUNGSPRAXIS

HARALD WIESER, PETER KAUFMANN, PHILIPP BRUNNER, WOLFGANG HAIDER, HARALD HOCHREITER, NORBERT KNOLL, LISA KOCH, KLAUS KUBECZKO, GERHARD REITSCHULER, SASCHA SARDADVAR, KLAUS SCHUCH AND MARIO STEYER

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KURZFASSUNG

Von der Politik wird zunehmend erwartet, dass sie aktiv zur Erreichung gesellschaftlich bzw. politisch festgelegter Umweltziele beiträgt. Vor diesem Hintergrund kann in den vergangenen Jahren auch eine verstärkte Berücksichtigung der Wirkungen der FTI-Politik auf die natürliche Umwelt beobachtet werden. Dies drückt sich sowohl in der Festlegung von Umweltkriterien sowie einer zunehmenden systemischen Orientierung von FTI-politischen Maßnahmen aus, um eine Transition hin zu einer klimaneutralen und ressourceneffizienten Gesellschaft zu unterstützen. Dieser Beitrag setzt sich mit den aus dieser „Ökologisierung" der FTI-Politik entstehenden Herausforderungen für die Evaluierungspraxis auseinander und stellt bestehende Ansätze zu ihrer Adressierung vor.

Schlagworte: Umweltwirkungen, FTI, systemisch, Evaluierung

ABSTRACT

Public policy is increasingly expected to actively contribute to the achievement of socially or politically defined environmental goals. Against this backdrop, increased consideration of the effects of RTI policy on the natural environment can be observed in recent years. This is expressed both ways, in the definition of environmental criteria and an increasing systemic orientation of RTI policy measures to support a transition towards a climate-neutral and resource-efficient society. This paper addresses some challenges for evaluation practice arising from this "greening" of RTI policy and presents existing approaches to address them.

Keywords: environmental impacts, RTI, systemic, evaluation

1. EINFÜHRUNG

Umweltpolitik sieht sich mit einer Reihe ökologischer und klimatischer Kipppunkte (sog. „Tipping Points") konfrontiert, mit deren Auslösung in der Literatur sowohl eine Beschleunigung wie auch Irreversibilität von Veränderungsprozessen verbunden wird (z.B. IPCC, 2019; Lenton, 2013). Im Vergleich zu anderen gesellschaftlichen Handlungsfeldern kommt der Setzung *zeitgerechter* und – in Hinblick auf die Vermeidung solcher Kipppunkte – *effektiver* Maßnahmen daher eine außerordentlich große Bedeutung in der Umweltpolitik zu. Dies gilt umso mehr in einer Zeit, in der bereits essentielle ökologische Systeme zu kollabieren drohen (Steffen et al., 2015). Mit zunehmender Dringlichkeit verändern sich damit auch die Anforderungen an den Forschungs-, Technologie- und Innovations- (FTI-)Sektor. Während die Grundlagenforschung traditionell eine herausragende Rolle in der Generierung und Vermittlung eines besseren Verständnisses komplexer Umweltprobleme einnahm, wird nun aufgrund der Dringlichkeit insbesondere zu den Themen Klima und Biodiversität auch von der angewandten Forschung eine tragende Rolle in der Bewältigung der Probleme erwartet. Damit einher geht die Erwartung, dass Innovationsprozesse auf intendierte wie auch nicht-intendierte Umwelteffekte untersucht werden und, soweit möglich sich von Anfang an, an übergeordneten, umweltpolitischen Zielen orientieren. Insoweit solche Erwartungen sich zunehmend in der Praxis widerspiegeln, können in den vergangenen Jahren durchaus Ansätze für eine „Ökologisierung" der österreichischen FTI-Politik beobachtet werden.

Vor diesem Hintergrund befasst sich dieser Beitrag mit den sich daraus ergebenden Herausforderungen für die Evaluierungsspraxis im FTI-Sektor. Ein Blick in das Archiv des fteval-Journals zeigt, dass Umweltwirkungen in der Evaluierung FTI-politischer Maßnahmen bisher kaum thematisiert wurden. Das vordergründige Ziel dieses Beitrags ist es daher, sich einen ersten Überblick der aktuellen Entwicklungen und bereits existierender, konzeptioneller wie methodischer Wissensbausteine für die Evaluierung der Umweltwirkungen FTI-politischer Maßnahmen zu verschaffen. Inhaltlich baut dieser Beitrag auf den von der fteval-Plattform initiierten und im Rahmen mehrerer Workshops getätigten Wissensaustausch zwischen EvaluatorInnen und ExpertInnen aus

Fördereinrichtungen auf, ein Austausch, der im Verfassen dieses Texts weiter vertieft wurde.

Der folgende Abschnitt beschreibt zunächst, wie sich die derzeitige Ökologisierung der österreichischen FTI-Politik darstellt. Die Gliederung der darauffolgenden Diskussion folgt einer Aufteilung der Herausforderungen in drei Kernbereiche der Evaluierung: der Wirkungsdimensionen (Abschnitt 3), der Wirkungslogik (Theoretische Herausforderungen: Abschnitt 4) und der Wirkungserfassung und –erreichung (Methodische Herausforderungen: Abschnitt 5). Abschließend fassen wir die wichtigsten Herausforderungen für EvaluatorInnen zusammen. Daraus leiten wir erste Empfehlungen für Förderagenturen und die zukünftige Evaluierungspraxis ab.

2. EINZUG UMWELTRELEVANTER ZIELE IN DER FTI-POLITIK IN ÖSTERREICH

Mit der FTI-Strategie 2030 wurde die Rolle der österreichischen FTI-Politik für die Erreichung umweltbezogener Ziele, in diesem Fall bezogen auf den Klimaschutz, erstmals auf strategischer Ebene verankert. Umweltrelevante Forschungs- und Innovationstätigkeiten werden damit aller Voraussicht nach deutlich an Bedeutung gewinnen. Ungeachtet dieser strategischen Ziele lässt sich bereits seit vielen Jahren eine verstärkte Ökologisierung der FTI-Politik in Österreich beobachten. Vereinfacht lässt sich diese Entwicklung an zwei sich ergänzenden Pfaden festmachen.

Der erste Pfad ergibt sich aus der Einführung und stärkeren Gewichtung von Umweltkriterien auf unterschiedlichen Ebenen: von der Wirkungsfolgenabschätzung von Förderprogrammen bis zur Selektion von Forschungs- und Investitionsprojekten und dem Design von bestehenden Förderprogrammen. Dieser Pfad kann zum Teil bereits für viele Jahrzehnte zurückverfolgt werden, allen voran in der Förderung von FTI-Aktivitäten in den Bereichen Energie, Stadtentwicklung und Mobilität. So spielen Förderprogramme wie StartClim (seit 2002) und das Austrian Climate Research Programme (seit 2008) eine tragende Rolle in der österreichischen Klimaforschung (Ecker et al., 2021) und weisen von Anfang an eine klare Umweltorientierung auf. Zugleich macht sich die Ökologisierung in diesem Sinne in jüngster Zeit verstärkt in traditionellen Bereichen der FTI-Politik bemerkbar, die lange davon unberührt blieben. Beispielsweise wird das Programm „Innovationsschutz" der Austria Wirtschaftsservice (aws) seit 2021 durch ein spezifisches Angebot („Green.IP") zum Schutz von Umwelttechnologien ergänzt. Ein weiteres Beispiel ist das kürzlich lancierte „Green Frontrunner"-Förderprogramm, das im Gegensatz zum Vorgängerprogramm einen expliziten Fokus auf Unternehmen mit Klima- und Umweltstrategie setzt. In der wirkungsorientierten Haushaltsführung des Bundes wurde mit der Einführung von Evaluierungen (wenn auch in einfachem Rahmen) im Zuge der wirkungsorientierten Folgenabschätzung (WFA) in zweierlei Hinsicht „Umwelt" nachhaltig platziert. Zum einen wurde mittels Verordnung die Wirkungsdimension Umwelt explizit als relevante Erfassungsgröße festgelegt (vgl. § 17 Abs. 3 Z 3 des Bundeshaushaltsgesetzes 2013 (BHG 2013), BGBl. I Nr. 139/2009). Andererseits wurde dadurch auch die Perspektive für nicht dezidiert mit Umweltthemen befasste Stellen und Maßnahmen wesentlich erweitert, da im Rahmen der Einvernehmensherstellung mit dem Bundesministerium für Finanzen auf Basis festgelegter Grenzwerte Umweltauswirkungen obligatorisch erfasst werden sollten.

Während der erste Pfad der FTI-Politik eine stärkere Direktionalität entlang von Umweltkriterien vorgibt, drückt sich der zweite und auch jüngere Pfad der Ökologisierung durch eine verstärkt systemische Orientierung aus. Die FTI-Politik sieht sich zunehmend in der gesellschaftlichen Verantwortung, wodurch der Anspruch erwächst, jenseits der Entwicklung neuer, „grüner" Produkte und Prozesse, einen wesentlichen Beitrag zu deren weitreichenden Einsatz in Produktion und Konsum zu leisten – ohne diesen können positive Umweltwirkungen nicht erreicht werden. Das Zielsystem wird dementsprechend weiter gefasst, sowohl bezüglich der Funktionen von Innovationssystemen als auch der Transition von Produktion-Konsumptions-Systemen (siehe Weber & Polt, 2014;

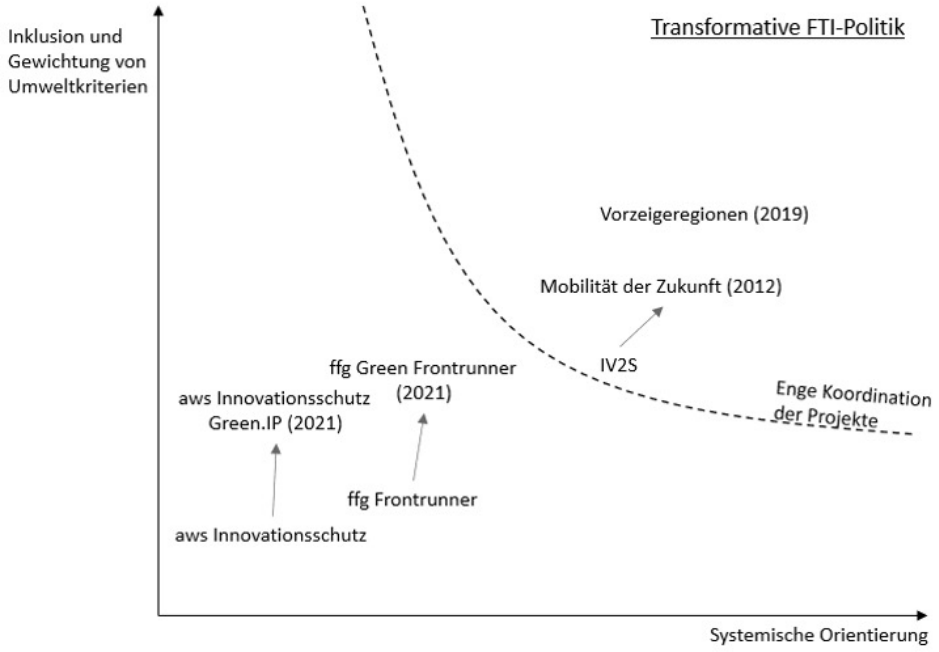

Abbildung 1: Schematische Darstellung beispielhafter Ökologisierungsprozesse in der österreichischen FTI-Politik

Weber & Rohracher, 2012). Beispielhaft seien hier die missionsorientierten Programme „Mobilität der Zukunft" im Mobilitätssektor und „e!MISSION" im Energiesektor und ihre jeweiligen Vorgänger genannt, die das Erreichen einer gesellschaftlichen Mission als Ziel definieren.

Die beiden Pfade ergänzen einander, indem ersterer eine grundlegende Richtung für die FTI-Politik vorgibt und letzterer sicherzustellen versucht, dass die gewünschten Wirkungen in Hinblick auf gesellschaftliche Bedürfnisse auch erreicht werden. In der Praxis werden sie je nach Handlungsfeld allerdings unterschiedlich stark verfolgt. So streben obengenannte missionsorientierte Programme auch viele Wirkungen jenseits der Umweltdimension an, die teilweise auch stärker gewichtet werden.[1] Instrumente wie „Green.IP" oder „Green Frontrunner" weisen hingegen einen klareren Fokus auf umweltorientierte Geschäftsfelder auf, fördern konkrete Akteure und Aktivitäten, aber sektorübergreifend ohne diese untereinander (systemisch) abzustimmen (siehe Abbildung 1). Ein im Vergleich dazu integrativerer Ansatz wird in der FTI-Initiative „Vorzeigeregion Energie" verfolgt, indem der Fokus auf Industrie-Regionen anstatt ausschließlich auf Technologien gelegt wird und per se eine systemische Ausrichtung verfolgt.

Mit Hinblick auf die Rolle von EvaluatorInnen muss kritisch bemerkt werden, dass trotz solcher, wenn auch teilweise noch junger Prozesse der Ökologisierung der österreichischen FTI-Politik, eine systematische Bewertung von Projekten und Programmen aus einer Umweltperspektive bestenfalls in Ansätzen festgestellt und noch nicht von einer „Durchdringung" der FTI-Politik gesprochen werden kann. So sind auf Umweltwirkungen bezugnehmende Evaluierungen noch kaum etabliert. Die folgenden Abschnitte diskutieren die aus unserer Sicht größten Herausforderungen für die Evaluierung in der Beachtung von Umweltwirkungen im FTI-Kontext und stellen aussichtsreiche Ansätze zu ihrer Adressierung vor. Bevor näher auf die umweltspezifischen Herausforderungen eingegangen werden kann, gilt es aber zunächst zu klären, welche Wirkungen in welchem Kontext zu beachten sind, wenn der Blick auf ökologische Effekte gelegt werden soll.

3. WIRKUNGSDIMENSIONEN

Als vielschichtiges und komplexes Themenfeld gibt es keinen Konsens über Elemente und Dimensionen, die unter den Bereich „Umwelt" fallen. Nach unserem Verständnis geht dieser Bereich über den umfassenden Umweltschutz hinaus und umfasst auch die Nachhaltigkeit bei der Nutzung von natürlichen Ressourcen (vgl. Bundesverfassungsgesetz über die Nachhaltigkeit, den Tierschutz, den umfassenden Umweltschutz, die Sicherstellung von Wasser- und Lebensmittelversorgung und die Forschung). Miedzinski et al (2013) schlagen diesbezüglich eine grobe Einteilung in vier besonders bedeutsame Umweltmedien vor, die oft getrennt voneinander beachtet werden: 1) erneuerbare und nicht-erneuerbare Materialien, 2) Wasser, 3) Landnutzung und 4) Treibhausgas- und Schadstoffemissionen. Die AutorInnen weisen zudem darauf hin, dass quer über diese Umweltmedien ein wichtiger Unterschied zwischen den aus menschlichen Aktivitäten resultierenden Umweltbelastungen („pressures") und Umweltwirkungen („impacts") besteht. In Bezug auf Materialien, zum Beispiel, ist die Erfassung des Materialverbrauchs (=Umweltbelastung) nicht mit tatsächlicher Ressourcenknappheit (=Umweltwirkung) zu verwechseln. Materialverbrauch an sich stellt nicht zwingend ein Problem dar, solange die Umwelt Belastungen ausgleichen kann. Zugleich kann Materialverbrauch sehr unterschiedliche Umweltwirkungen verursachen, unabhängig von der Verfügbarkeit von materiellen Ressourcen.

Je nach Spezifikation der Programmziele ergibt sich für EvaluatorInnen die zusätzliche Herausforderung, definieren zu müssen, welche konkreten Umweltmedien hinsichtlich eines bestimmten Handlungsfelds relevant sind. Bestehende und teils bereits etablierte Indikatorenrahmen können hier eine Referenz bieten, indem sie eine Vorauswahl an Umweltindikatoren für diverse Handlungsfelder definieren. Tabelle 1 zeigt einen Überblick ausgewählter Indikatorenrahmen mit starkem Umweltbezug. Abseits unterschiedlicher thematischer Schwerpunkte ordnen die jeweiligen Rahmen die Indikatoren unterschiedlich ein, wobei mehrere Logiken der Kategorisierung erkennbar sind:

- **Umweltmedien**: Ähnlich der oben genannten Kategorisierung von Miedzinski et al. (2013) findet man vor allem in den Indikatorenrahmen der Vereinten Nationen („SDG-Indikatoren") und der Statistik Austria („Wie geht's Österreich?") mehrere nach Umweltmedien gegliederte Indikatoren. Letzteres enthält beispielsweise Indikatoren gegliedert nach Ressourcen, Klimawandel/Emissionen und Energie. So fallen z.B. unter Ressourcen drei Indikatoren: inländischer Materialverbrauch, Anteil an Bioflächen und Anteil an versiegelten Flächen.
- **Wirtschaftssektoren- und Gebiete**: Insbesondere im SDG-Indikatorenrahmen findet man ausgewählte Indikatoren für unterschiedliche Wirtschaftssektoren und -gebiete wie Mobilität, Landwirtschaft oder Städte.
- **Zeitlichkeit**: Der Indikatorenrahmen „How's Life?" der OECD sticht durch eine starke Gliederung nach der Zeitlichkeit der erwarteten Wirkungen hervor. Diese ergibt sich durch die Unterscheidung zwischen Wirkungen auf die derzeitige Lebensqualität sowie auf Ressourcen, die zukünftige Lebensqualität bestimmen.
- **Wertschöpfungskette**: Mit dem noch jungen Indikatorenrahmen der Europäischen Kommission für die Kreislaufwirtschaft wird verstärkt auf die unterschiedlichen Phasen entlang der Wertschöpfungsketten eingegangen. Indikatoren werden hier der Produktion, dem Konsum, dem Abfallmanagement und der Wiederverwendung von Ressourcen zugewiesen.

Bei umfassenden Indikatorenrahmen ist es durchaus üblich, dass mehrere Kategorisierungslogiken miteinander vermischt werden. So wird beispielsweise im Bereich Umwelt von "Wie geht's Österreich?" drei nach Umweltmedien gegliederten Bereichen (Ressourcen, Klimawandel/Emissionen, Energie) das Handlungsfeld Verkehr/Mobilität nebenangestellt. Energieverbrauch und Treibhausgasemissionen werden somit sowohl auf nationaler, sektorübergreifender Ebene wie auch spezifisch für

1 Eine umfassendere Orientierung an unterschiedlichen Zieldimensionen im Sinne der ökologischen, sozialen und ökonomischen Nachhaltigkeit ist durchaus charakteristisch für „transformative" FTI-Politik (Schot & Steinmueller, 2018).

den Mobilitätsbereich erhoben. Was für das akademisch trainierte Auge verwirrend wirkt und die Aggregation erschwert, kann für EvaluatorInnen durchaus vorteilhaft sein, insoweit damit – der komplexen Realität entsprechend – unterschiedlichste Handlungsfelder abgedeckt werden.[2]

Tabelle 1: Ebenen der Kategorisierung von umweltbezogenen Handlungsfeldern in etablierten Indikatorenrahmen

	How's Life? (OECD)	SDG Indicator Framework (Vereinte Nationen)	Wie geht's Österreich? (Statistik Austria)	Circular Economy Monitoring Framework (Europäische Kommission)
Umweltmedien	X	X	X	
Wirtschaftssektoren- und Gebiete		X	X	X
Zeitlichkeit	X			
Wertschöpfungskette		X		X

Die Heranziehung von globalen Umweltindikatoren in der Evaluierung von konkreten FTI-Maßnahmen erweist sich allerdings oft als schwierig, da die Distanz zwischen der Forschungsleistung und der Umweltwirkung im Zuge der Anwendung sehr hoch sein kann; sowohl in zeitlicher und geographischer Hinsicht, wie auch in Anbetracht multidimensionaler weiterer Faktoren (siehe Miedzinski et al., 2013; Molas-Gallart et al., 2020). Eine Auseinandersetzung mit der konzeptionellen Fundierung von FTI-Maßnahmen anhand der Entwicklung von Interventionslogiken (oder Wirkungsmodellen im Falle einer theoriebasierten Evaluation) ist daher unabdinglich und zukünftig gezielt anzustreben. Zugleich müssen Attribution und die Effektivität bestehender Maßnahmen nicht zwingend im Vordergrund einer Evaluierung stehen. Der folgende Abschnitt geht auf konzeptionelle Bausteine ein, die zu diesen unterschiedlichen Zwecken entwickelt wurden.

4. KONZEPTIONELLE HERAUSFORDERUNGEN

Eine Interventions- bzw. Wirkungslogik zeigt die Erwartungen auf, wie eine getroffene Maßnahme entsprechende Wirkungen erzielen soll. Die Gliederung nach den fünf Elementen Input, Aktivitäten, Outputs, Outcomes und Impacts hat sich in der Evaluierungspraxis weitgehend etabliert. Wie bei den zuvor besprochenen Handlungsfeldern existieren auch in Bezug auf diese Elemente Versuche einer internationalen Vereinheitlichung in der Auswahl der Indikatoren. Hervorzuheben sind hier der Global Cleantech Innovation Index, der ASEM Eco-Innovation Index und das im österreichischen Kontext besonders relevante Eco-Innovation Scoreboard. Letzteres führt drei bis vier Indikatoren für jede Ebene an, wobei Impacts lediglich in Relation zum Bruttoinlandsprodukt gemessen werden. Beispiele für Indikatoren entlang der Wirkungsstufen sind die staatlichen Ausgaben für umweltrelevante Forschung (Input), die Implementierung von nachhaltigen Produkten in Klein- und Mittelbetrieben (Aktivitäten), auf Ökoinnovationen bezogene Patente (Output), die Beschäftigung in den Bereichen Umweltschutz und Ressourcenmanagement (Outcome) und die Materialproduktivität (Impact).

Das Heranziehen solcher Indikatoren ist dann am sinnvollsten, wenn von einer stark linearen Wirkungskette ausgegangen werden kann. Tatsächlich klafft jedoch zwischen Leistungen wie der Anzahl von „grünen" Patenten und den Beiträgen zur Lösung von Umweltproblemen oft eine große Lücke. Ein wichtiger Faktor sind hier beispielsweise die sogenannten Rebound-Effekte. Diese treten auf, wenn durch Innovationen erzielte Effizienzgewinne zugleich Verhaltensänderungen herbeiführen, die diese Gewinne (teilweise) wieder zunichtemachen. Solche Rückkoppelungen bedeuten einen klaren Bruch mit der linearen Logik einer Wirkungs- oder Kausalkette. Aus FTI-Perspektive sind Rebound-Effekte zudem besonders schwer zu berücksichtigen, da sie erst zutage treten, sobald sozioökomische Veränderungen durch die Einführung innovativer Produkte oder Prozesse entstehen. Unterschiedliche Innovationen, verstanden als durchgesetzte Inventionen, sind jedoch mehr oder weniger für Rebound Effekte anfällig. So ist sich laut Henry et al. (2021) die wissenschaftliche Literatur darin überwiegend einig, dass derartige Effekte eher durch disruptive anstatt inkrementeller Innovationen nied-

2 Die Forschungs- und Innovationstätigkeiten selbst stellen ein Handlungsfeld dar, das in solchen Indikatorenrahmen nicht abgedeckt ist. Einige österreichische Universitäten haben bereits damit begonnen, ihre Klimabilanz zu berechnen, und die meisten haben sich auch zum Ziel gesetzt, klimaneutral zu werden (Getzinger et al., 2019). Darüber hinaus wurde im Rahmen des bereits genannten Austrian Climate Research Programme klimafreundliche Forschung in die Auswahlkriterien mitaufgenommen. Damit wird anerkannt, dass der FTI-Bereich selbst einen signifikanten Beitrag zur Lösung von Umweltproblemen leisten kann. In diesem Sinne sollten Evaluierungen nicht nur umweltbezogene FTI adressieren, sondern auch in Betracht ziehen, wie umweltfreundlich FTI-Aktivitäten selbst sind. Die quantitative Erfassung dieser Umweltwirkungen, sofern entsprechende Daten erhoben werden können, sollte dabei keine große Hürde darstellen.

rig gehalten werden können, und koordinierte Maßnahmen sowohl auf Produktions- wie auch Konsumseite am vielversprechendsten sind. EvaluatorInnen können hier auf den Ergebnissen einer Studie von Seebauer et al. (2020) aufbauen, in der ein Indikatorensystem für die Erfassung und Antizipation von Rebound-Effekten bei Mobilitätsinnovationen entwickelt wurde.

Der Sachverhalt der Rebound-Effekte verweist auf die allgemeinere Problematik, dass die Erzielung positiver Umweltwirkungen nur schwer (wenn überhaupt) auf Basis einzelner Innovationen in Produkten oder Prozessen erreicht werden kann. In der einschlägigen Literatur zu Innovationsprozessen herrscht mittlerweile Konsens darüber, dass wissenschaftlicher und technologischer Fortschritt tiefgreifender Veränderungen auf einer *systemischen* Ebene bedarf (Soete, Verspagen, & ter Weel, 2010). Die Popularität von systemtheoretischen Ansätzen ist unter anderem darauf zurückzuführen, dass sie relativ einfache und intuitive Aussagen über komplexe Sachverhalte erlauben und damit gut für die Schnittstelle von Wissenschaft und Politik geeignet sind, zugleich aber diese Sachverhalte gut strukturieren, ohne allzu grob zu simplifizieren (Magro & Wilson, 2013). Zudem erlauben solche Ansätze gerade in Bezug auf Umweltdynamiken einen leichteren interdisziplinären Austausch mit NaturwissenschaftlerInnen, wo systemtheoretische Konzepte fest verankert sind (woraus beispielsweise die eingangs erwähnten Kippunkte abgeleitet werden).

Aus einer systemtheoretischen Sicht kann eine Orientierung an quantitativen Indikatoren und kurzfristigen Erfolgen in der Erzielung von Umweltwirkungen, wie auch ein übermäßiger Fokus in der Evaluierung auf Rechenschaftslegung (accountability), sich über einen längeren Zeitraum als kontraproduktiv erweisen (Janssen et al., 2020). Vielmehr gilt es zur Erreichung einer höheren Hebelwirkung jene Systemelemente zu adressieren, die zur Stabilisierung bestehender Dynamiken beitragen. Entscheidend dafür sind zum einen diverse Interaktionseffekte (wie Rebound-, Spillover- oder Netzwerkseffekte), die durch das Zusammenspiel unterschiedlicher Akteure und Organisationen (z.B. ergänzt um soziale Innovationen) entstehen und systemische „Lock-ins" erzeugen können. Zum anderen wird vor allem im Nachhaltigkeitskontext anerkannt, dass Systeme wie die Sektoren Mobilität oder Energie zudem jeweils spezifische, mehr oder weniger fest verankerte Handlungsregeln aufweisen, die Innovationen eine Richtung vorgeben und damit mögliche Alternativen ausschließen können (Geels, 2004).

Eine systemische Analyse in Evaluationen kann auf Vorarbeiten aufbauen, in denen konkrete Komponenten aus etablierten Theorien von Nachhaltigkeitstransitionen abgeleitet werden (für Übersichten, siehe Boni, Giachi & Molas-Gallart, 2019; Molas-Gallart et al., 2020). Diese sollten von der FTI-Politik adressiert und in Evaluierungen berücksichtigt werden. Die Kernherausforderung für EvaluatorInnen besteht in der Formulierung eines Ansatzes, der systemische Effekte auf unterschiedlichen Ebenen berücksichtigt und zugleich den Beitrag von FTI-politischen Maßnahmen zu ihrer Veränderung aufzeigen kann. Einige der bestehenden Ansätze führen eine Reihe von Komponenten an, die als kritisch für ein Produktions-Konsumptions-System erachtet werden. Miedzinski et al. (2013), zum Beispiel, führen fünf Bereiche an: Wissensgenerierung und Lernsystem („knowledge generation and learning system"), Politik, Regulierung und Governance („policy, regulation and governance system"), soziale Praktiken und Konsummuster („social practice and consumption patterns"), Produktionssysteme und Geschäftsmodelle („production system and business models") und technische Infrastrukturen und gebaute Umwelt („technical infrastructures and built environment"). Wie an diesem Beispiel ersichtlich, bleibt das Abstraktionsniveau allerdings sehr hoch, wobei je nach Ansatz die Auswahl unterschiedlich stark theoretisch fundiert sein kann. Zugleich garantiert selbst ein hohes Abstraktionsniveau nicht, dass alle wichtigen Aspekte abgedeckt werden. Die Organisation bzw. das Management von Reststoffen und Prozessen der Wiederverwertung werden beispielsweise unserer Ansicht nach in der Auswahl von Miedzinski et al. (2013) nicht ausreichend berücksichtigt. Auch wichtige Querschnittsthemen wie der Umgang mit Risiken und Verteilungswirkungen sollten in die Analysen integriert werden (siehe Tabelle 2). Je nach Handlungsebene (Mikro, Meso, Makro) muss das Abstraktionsniveau zudem an die jeweils relevanten Kompetenzen, Aufgaben und Ziele des Evaluationsgegenstands angepasst werden. Eine besondere konzeptionelle Herausforderung, vor allem in Bezug auf FTI-Maßnahmen, liegt hier oft in der Abgrenzung des Evaluationsgegenstands und dem Gesamtsystem.

Aus der Sicht der Evaluierung stellt sich weiters die Frage, ob diverse Systemkomponenten horizontal zueinanderstehen und mit der gleichen Priorität zu behandeln sind. Der Mangel an Kriterien für die Auswahl der wichtigsten, ggf. zu priorisierenden Interventionspunkte bleibt somit ein Schwachpunkt in der Innovationsliteratur (Kanger, Sovacool & Noorkõiv, 2020). Ein in diesem Sinne alternativer, vielleicht auch komplementärer Ansatz zu den obengenannten, ist der sogenannte „Leverage-Points-Ansatz", der auf den systemtheoretischen Arbeiten von Meadows (1999) beruht. Dieser Ansatz schlägt eine klare Hierarchie von zehn generischen Interventionspunkten vor, die in absteigender Reihenfolge in vier Kategorien eingeteilt werden: Intent, Design, Feedbacks und Parameter. Unter „Intent" werden Aspekte wie gesellschaftspolitische Ziele, Mindsets und Paradigmen sowie Kräfte zur Überwindung vorherrschender Paradigmen verstanden. „Design" subsumiert Aspekte wie Informationsstrukturen, Spielregeln und Ansätze zum Systemwandel. „Feedbacks" bezieht sich auf Aspekte wie negative Feedbackschleifen, Verzögerungen und Reibungsverluste im Systemwandel sowie soziale Profite im Zusammenhang mit positiven Feedbackschleifen. Unter „Parameters" schließlich versteht man Konstanten, Puffer, sowie die Struktur von Materialbeständen und Materialflüssen. Punkte, die in der Hierarchie auf einer höheren Ebene lokalisiert werden, sind systemisch tiefgreifender und damit schwierig zu verändern, aber weisen selbst bei kleinen Veränderungen eine relativ hohe Hebelwirkung auf. Auf Basis dieser Hierarchie können somit qualitative Bewertungen der systemischen Orientierung von politischen Maßnahmen unternommen werden.

Erste Anwendungen in Handlungsfeldern wie Städten (Angheliou & Tennant, 2020) oder Energie und Nahrungsmittel (Dorninger et al., 2020) konnten auf dieser Basis aufzeigen, dass bestehende Maßnahmen hinsichtlich ihrer systemischen Orientierung deutlich hinter ihren Ansprüchen zurückfallen. Für sich genommen kann der Leverage-Points-Ansatz allerdings bestenfalls einen Beitrag für umfassende Evaluierungen von FTI-politischen Maßnahmen leisten. Dabei gilt es noch herauszuarbeiten, wie dieser in eine (zukünftige) Wirkungslogik integriert werden kann. So vermeintlich simpel wie hierarchische und horizontale Ansätze alleinstehend aufgebaut sein mögen, bringt ihre Verknüpfung erhebliche Herausforderungen mit sich, nicht zuletzt was die Veranschaulichung anbelangt. Oft ist es gerade der Zwang zur zweidimensionalen Veranschaulichung, der eine solche Verknüpfung erschwert. Eine vielleicht einfachere Lösung dieses Dilemmas wird von Kieft, Harmsen und Hekkert (2020) verfolgt, indem sie die Logik des Hebelpunktansatzes für die Hierarchisierung der Komponenten von technologischen Innovationssystemen heranziehen.

Tabelle 2: Wirkungsebenen mit beispielhaften Indikatoren

Wirkungsebenen	Indikatoren	Querschnittsdimensionen
Inputs & Outputs der F&E- & Innovationsphasen • Budgets / Ausgaben • Kapazitätsänderung (FuE-Fähigkeiten, Verhaltensänderungen) • Produkte, Dienstleistungen, Prozesse	z.B. • Ausgaben für umweltrelevante Forschung & Entwicklung • Akademische Publikationen mit Umweltbezug • Grüne Patente	
Sozio-ökonomische Effekte • Produktion & Geschäftsmodelle • Konsum & soziale Praktiken • Management von Reststoffen/Reuse • Technische Infrastruktur & Bauten • Wissensgenerierung & Lernen • Governance & Regulation/Standards	z.B. • Energie-, Wasser- und Materialinput in der Wertschöpfungskette (Anteil von Sekundärrohstoffen am Materialinput, Recyclingrate, Energie- und Wasserintensität) • Marktanteil von Öko-Produkten / Öko-DL • Kapazitätsentwicklung von Humanressourcen • Investitionen in energie- & ressourcenschonendere Infrastruktur • Änderung von Normen/Standards/Gesetzte zur Ermöglichung von Öko-Innovationen • Diffusion von Öko-Innovationen • Soziale Praxis - Zeitbudgets	• Verringerung von Risiken • Verteilungswirkungen • Skalierung (Mikro-, Meso-, Makroebene)
Umweltbelastungen • Materialverbrauch • Wassernutzung • Landnutzung • Emissionen in Luft, Wasser und Böden	z.B. • Materialverbrauch, Schadstoffkonzentration, Kosten der Reinigung • Wasserverbrauch, Schadstoffkonzentration, Kosten der Reinigung • Landkonversionsrate, Erosion, Fertilität, Kosten der Regeneration • Diverse Ressourcenproduktivitäts- und Fußabdruck-Indikatoren als Maß für Knappheit • THG-Emissionen	
Umweltwirkungen Ökosysteme und Biodiversität • Personen (Gesundheit, Erholungswert) • Natürliche Ressourcen • Physische Artefakte (menschengemachte Umwelt)	z.B. • Entwicklung der Biodiversität • Wohlfahrt von Tieren & bedrohte Tierarten • Todesfälle aufgrund von Luftverschmutzung • Veränderung von Lebensräumen • Versicherungskosten gegen negative Umwelteffekte	

Quelle: Eigene Darstellung (ausgehend von Miedzinski et al., 2013)

Die in diesem Abschnitt diskutierten, konzeptionellen Bausteine für EvaluatorInnen sind besonders gut geeignet für die Unterstützung von Lernprozessen bezüglich der Wirkungs- und Interventionslogik von FTI-politischen Maßnahmen, können aber je nach Kontext und konkreter Ausgestaltung auch für die Attribution von Wirkungen zu spezifischen Maßnahmen herangezogen werden. Diesbezüglich werden in der Literatur unterschiedliche Ansätze für die Gestaltung von Evaluierungen verfolgt, von stark theorie-basiert bis zu handlungsweisend (siehe Boni et al., 2020). Der folgende Abschnitt geht komplementär zur bisherigen Diskussion auf die methodischen Herausforderungen und Bausteine ein.

5. METHODISCHE HERAUSFORDERUNGEN

Welche methodischen Herausforderungen ergeben sich durch die Berücksichtigung von Umweltkriterien und der systemischen Orientierung von Politikmaßnahmen und damit deren Evaluierung? Und was kann die FTI-Evaluierung diesbezüglich anbieten?

Es lässt sich vorweg festhalten, dass die bisherigen Beiträge relativ gering sind. Dies kann nicht nur auf einen schwach ausgeprägten Fokus einer ernsthaften Untersuchung von Umweltwirkungen aufgrund der

Präferenz von Politik und Institutionen, sondern auch auf methodische Gründe zurückgeführt werden.

Einerseits wird nur in Ausnahmefällen bereits im Design von Maßnahmen (z.B. Förderprogramme für F&E, Bewusstseinsbildung, Schulungen, Wissenstransfer) anhand von gut durchdachten Interventions- bzw. Wirkungslogiken das mögliche Wirkungsspektrum aufgezeigt (sowie der nachgelagerten Indikatoren), obwohl ein detailliertes Verständnis der Wirkungslogik essenziell zur Gestaltung von effektiven Maßnahmen ist (und in den Köpfen der handelnden Personen zumindest ansatzweise existiert). Anstatt dessen gibt es eher die Tendenz zu schlanken Indikatorensets, auch um institutionelle Überprüfungen im Zuge der wirkungsorientierten Haushaltsführung sowie von Kontrollorganen wie den Rechnungshof nicht ‚ausufern' zu lassen. Bislang wäre es schwergefallen, die nötige Information in einem Monitoring oder bei Evaluierungen auf Basis einer validen Methodik bzw. einem vertretbaren Aufwand darzustellen.

Aber auch von Agenturseite wird eine gewisse Zurückhaltung nahegelegt, wenn es darum geht, dass die FördernehmerInnen zur Erfassung von Umweltdaten nur für das FTI-Monitoring verpflichtet werden sollen. Einerseits spricht dies eine Belastungsgrenze von FördernehmerInnen hinsichtlich administrativer Nebentätigkeiten in Forschungsprojekten an, andererseits geht es auch um die oft mangelnde Validität der Abschätzung von Umwelteffekten im Zuge von Forschungsprojekten, die mitunter noch relativ weit von einer konkreten Anwendung mit seinen vielfältigen Kontexten entfernt sind. Die Förderagenturen beobachten jedoch die Entwicklung zum Nachhaltigkeitsreporting (zB GRI, SASB) und der EU (zB Non Financial Disclosure Regulation (NFDR), Taxonomy on Sustainable Finance) und werden diese, soweit passend, auch in ihren Instrumenten adressieren.

Diese Diskussion hat Auswirkungen auf das Anspruchsniveau und die Ebene der Analyse, die mit der Berücksichtigung von Umwelteffekten verbunden sind:

Auf der Mikroebene, also im Zuge der Projektauswahl (Festlegung von Förderkriterien, Ausgestaltung des Bewertungsprozesses) und direkt bei den FördernehmerInnen, geht es einerseits darum, Projekte mit potenziell gröberen, negativen Umweltwirkungen auszusortieren, da es keine Begründung dafür gibt, wieso derartige Projekte mit öffentlichen Mitteln unterstützt werden sollten. Darüber hinaus ist der größte Mehrwert wahrscheinlich dort zu finden, wo radikalen Innovationen mit potenziell sehr großen Umwelteffekten der Vorzug gegenüber inkrementellen Innovationen gegeben wird. Aufgrund der heterogenen Struktur der Informationsbasen für wirtschaftliche, gesellschaftliche und ökologische Effekte wird eine Ex-Ante-Festlegung einer Ausgangsbasis für eine spätere Evaluierung umso wichtiger werden.

Bei den FördernehmerInnen stiftet man möglicherweise die größte Hebelwirkung, wenn man sicherstellt, dass potenzielle Umwelteffekte bereits in der Ideenphase, dem Forschungsprozess, sowie beim Transfer in die spätere Anwendung mitberücksichtigt werden. Entlang dieser Prozesskette gibt es viele Entscheidungen, die einen Unterschied machen können. Analog dazu kann man die vielfältigen Anwendungen und Effekte im Zuge der Digitalisierungsschritte unserer Wirtschaft und Lebensbereiche heranziehen. Dieser Hebel liegt somit in der Ausgestaltung der Antragsphase, der Begleitung und Berichtslegung und jener der Anschlussfinanzierung von Projekten.

Exkurs: Im Jahr 2014 wurden das UBA und die AIT mit dem Projekt „methodische Grundlagen für ein indikatorenbasiertes ex-ante Impact Assessment von energie- und mobilitätsrelevanten FTI-Förderprogrammen des BMVIT" beauftragt. Das Projekt hatte zum Ziel, zwei FTI politische Programme („Energieforschung 2020" und „Mobilität der Zukunft") hinsichtlich ihrer zukünftigen Wirkung zu analysieren – und, wenn möglich – die Wirkung quantitativ abzuschätzen. Dies wurde unter anderem durch die seit Beginn 2013 geltende Verordnung zur wirkungsorientierten Folgenabschätzung (BGBl. II Nr. 489/2012) notwendig. Insbesondere sollten anhand der Programme Möglichkeiten aber auch Grenzen des ex-ante–Impact-Assessment von FTI-politischen Instrumenten im Hinblick auf Umweltindikatoren aufgezeigt werden. Dabei wurde nahegelegt, dass aufgrund der komplexen Wirkungszusammenhänge und der hohen Ungewissheit über zukünftige Entwicklungen hinsichtlich einer Vielzahl externer Faktoren, ein quantifizierter Beitrag der FTI-Politikmaßnahmen im Rahmen dieses Projekts nicht abgeschätzt werden konnte. Es fehle an wissenschaftlicher Methodik für eine Evaluierung wofür gegebenenfalls ein hoher modelltechnischer Aufwand erforderlich wäre.

Auf Meso- und Makroebene sind detailliertere Analysen mit aufwändigeren Methodensets jedenfalls angebracht. Hier könnte man mit einem Perspektivenwechsel durchaus aus einem Mix von quantitativen (Stichwort: Datenverfügbarkeit) und qualitativen Analysen unter anderem auch anhand systematischer Prozessanalysen Wirkungsstränge ex-post aufgearbeitet werden. Ausgehend von real beobachteten Effekten könnten damit Rückschlüsse auf Kausalitäten nachgezeichnet werden, die Einsichten auf die vielfältige Rolle des FTI-Systems sowie anderer Rahmenbedingungen liefern. Derartige Analysen sind für Österreich bislang kaum bekannt.

Der Einbezug von Umwelteffekten in die FTI-Politikanalyse verstärkt auf methodischer Ebene, was die FTI-Community bereits seit längerem anmerkt. Die Verfügbarkeit und Kombinierbarkeit von Sekundär-Datensätzen ist derzeit beschränkt, und wird sich mit der Ergänzung um Umweltdaten noch verschärfen. Dies ist jedenfalls im Rahmen der Reform des Statistikgesetzes zu berücksichtigen, benötigt aber auch zusätzliche, institutionelle Maßnahmen. Die in diesem Zusammenhang zu stellenden Fragen lauten in etwa:

- Welche spezifische Expertise ist in Bezug auf die Untersuchung von Umweltwirkung erforderlich? Inwieweit ist diese bereits vorhanden bzw. wie ist sie derzeit verteilt?
- Welche Daten sind entlang eines angedachten Wirkungsstranges erforderlich?
- Welche Sekundärdaten sind verfügbar? Wie sind diese kombinierbar? (z.B. sektorspezifische Daten auf nationaler, europäischer und internationaler Ebene, Patentanmeldungen in Umwelttechnologien (gemäß OECD), CO2-Emissionen nach Sektor auf nationaler Ebene, Abfall, Anteil Wiederverwertung von Rohstoffen, etc.)
- Welche Daten werden bereits routinemäßig erhoben (z.B. grüne Patente, SDG-Attribution)?
- Wie geht man mit der Lücke zwischen projektbezogenen Daten und aggregierten Daten auf nationaler Ebene um? Welche methodischen Konsequenzen ergeben sich daraus?

- Wie ist eine Plausibilisierung der Angaben der FörderwerberInnen durch ExpertInnen in der Jury-Bewertung umzusetzen (teilweise sind fachspezifische Qualifikationen, z.B. im Bereich digitale Technologien, nicht hinreichend um Umweltwirkungen zu beurteilen)? Reichen semi-quantitative Einschätzungen?
- Nachdem die oben genannten Quellen bestmöglich abgedeckt sind: Welche Daten können FörderwerberInnen sinnstiftend in welcher Form liefern, unter der Prämisse, dass diese valide Informationen liefern können und nicht mit Anforderungen überfrachtet werden sollen?
- Neben der Datenerhebung und Monitoring geht es ebenfalls um die Begleitung, Feedback und einen systemischen Lernprozess. Hier stellt sich die Frage, wie ein derartiger Lernprozess ausgestaltet sein soll und welche Rolle NutzerInnen und andere relevante Stakeholder darin spielen – speziell, wenn systemische Transition (Schot & Steinmueller, 2018) das Ziel darstellt? Soll eine Evaluierung folglich begleitend angelegt sein (siehe Kaufmann et al., 2014)?

Als eine relevante Randbedingung auf europäischer Ebene sollte noch berücksichtigt werden, dass mit der Non-Financial Disclosure Regulation und der Taxonomy on Sustainable Finance ab 2022 zwei EU-Verordnungen in Kraft treten werden, die Großunternehmen und Banken zu umfangreichen Datenerfassungen hinsichtlich ihrer Klimarelevanz verpflichten. Weitere Umweltdimensionen und soziale Aspekte folgen in einem zweiten Schritt, womit möglicherweise auch kleinere Unternehmen adressiert werden. Damit entwickeln sich auch (neue) Reporting- und Zertifizierungssysteme, auf deren Informationsgrundlagen auch in Evaluierungen aufgebaut werden könnte.

Auf globaler Ebene ist insbesondere die Initiative zu einem ‚Sustainability Reporting' anhand von Standards der Global Reporting Initiative (GRI) sowie dem Sustainability Accounting Standards Board (SASB) zu erwähnen. In Österreich hat die Finanzmarktaufsicht (2020) einen Bericht vorgelegt, in dem auf Basis eines Leitfadens zum Umgang mit Nachhaltigkeitsrisiken ein Indikatorenset auf Unternehmensebene entwickelt wird, das die Exponiertheit von Unternehmen im Finanzsektor hinsichtlich Klimarisiken aufzeigt.

Ein besserer Datenzugang alleine kann allerdings die Probleme, welche durch mögliche Wechselwirkungen und Interaktionseffekte wie obengenannte Rebound-Effekte verursacht werden, nicht ausreichend adressieren. Über quantitative, wie z.B. ökonometrische, Methoden hinaus, verschärft sich daher die Notwendigkeit auch qualitativ-kausale Methoden stärker zum Einsatz zu bringen. Diese könnten beispielsweise strukturell-kausale Modelle (SCM) und die Nutzung von Graphen umfassen, wodurch direkte und indirekte Zusammenhänge (siehe Pearl et al 2016) beschrieben werden und sich in ökonometrisch-kausale Ansätze überführen lassen. Um auch Veränderungsprozesse unter Berücksichtigung solch nicht-linearer Dynamiken besser verstehen zu können, bieten sich beispielsweise qualitative Modellierungen von Systemdynamiken an (z.B. Boons et al., 2021).

6. SCHLUSSFOLGERUNGEN UND AUSSICHT

Die in diesem Beitrag aufgezeigten Prozesse einer Ökologisierung der österreichischen FTI-Politik stellen die Evaluierungspraxis vor erhebliche Herausforderungen. In Bezug auf konzeptionelle Fragestellungen lassen sich diese wie folgt zusammenfassen:

- Die Distanz zwischen Forschungsleistung und Umweltwirkung erschwert Schlussfolgerungen über kausale Zusammenhänge erheblich. Leichter ist der Zusammenhang von konkreten Investitionsentscheidungen und Umweltwirkungen herzustellen.
- Es besteht ein Missverhältnis zwischen der Komplexität systemisch orientierter FTI-politischer Maßnahmen und der Komplexität, die in Wirkungsmodellen üblicherweise dargestellt wird und teilweise auch dargestellt werden kann. Damit bleibt die Frage offen, welche konkreten Umweltwirkungen in einem gegebenen Handlungsfeld zu beachten sind, bzw. wo die Grenze der Betrachtung gezogen werden soll.

Wie die vorangegangenen Abschnitte auf Basis einer Auswahl von konzeptionellen Rahmen und Indikatorensets aufzeigten, existieren bereits diverse Ansätze und Überlegungen, wie diese Herausforderungen angegangen werden können. Ein fortlaufender Austausch zwischen den FTI-relevanten Stakeholdern mit neuen TeilnehmerInnen mit Umweltkompetenz wird nötig sein, um diese Ansätze in Spiegelung der oben erwähnten EU und internationalen Initiativen weiterzuentwickeln.

Ein Teil der Hürden für EvaluatorInnen sind darauf zurückzuführen, dass die Ökologisierung von FTI-politischen Maßnahmen noch nicht standardmäßig in die Leistungsbeschreibungen (Terms of Reference) und Methoden der Datenerhebung vorgedrungen ist. Damit fehlt es sowohl an Anreizen wie auch an essenziellen Grundlagen für umfassendere Analysen von Umweltwirkungen. Um solche Analysen zu ermöglichen, sind zudem spezifische Kompetenzen erforderlich, die über rein technologische Fragestellungen hinausgehen.

Grundsätzlich ist bereits bei der Konzeption einer Maßnahme wie z.B. einem Förderprogramm anzusetzen, indem eine klare Vorstellung von der Interventions- bzw. Wirkungslogik entwickelt wird, die nicht nur direkte und indirekte beabsichtigte Effekte, sondern auch mögliche nicht-intendierte Nebeneffekte thematisiert.

In einem nächsten Schritt ist die Programmabwicklung daraufhin zu prüfen, welche Kriterien zur Projektauswahl und sonstige Informationen zur unmittelbaren Steuerung (Monitoring) sowie für eine spätere Evaluierung wann und wo nötig sind. So hat z.B. jede Jury zur Projektauswahl eine Selektion förderwürdiger Projekte vorzunehmen, die anhand eines vorausgewählten Sets an Kriterien erfolgt. An dieser Stelle werden die Weichen gestellt, ob mit dem Programm auf Outcome- und Impact-Ebene die gewünschten Effekte erzielt werden. In einem gewissen Ausmaß werden aber nicht nur die festgelegten Kriterien die Projektauswahl beeinflussen, sondern auch die Zusammenstellung der beurteilenden Jury. Auch dies gilt es zu reflektieren.

Programmmanagement, Monitoring und Evaluation könnten sehr davon profitieren, wenn es klare Verbindungen zwischen der Ebene der Programmziele, der Auswahlkriterien, dem Monitoring während der Projektumsetzung sowie der Wirkungen aufgrund der Umsetzung der Projektresultate gäbe. Ein derart durchgängiges Design ist manchmal sogar noch für angestammte (FTI-)Indikatoren eine Herausforderung,

und jedenfalls noch hinsichtlich Umwelteffekten unterentwickelt. Diese Herangehensweise kann die Schlüssigkeit von Indikatorensystemen noch substanziell erhöhen.

Im Kontext der zunehmend systemischen Orientierung wichtiger Förderinstrumente, wo Unsicherheiten und die Notwendigkeit begleiteter Lernprozesse gegenüber der Rechenschaftslegung stärker ins Gewicht fallen, bedarf es außerdem einer flexibleren Einbindung von EvaluatorInnen (vgl. van Mierlo et al., 2010) bzw. flexiblerer Evaluierungszugänge, wie sie beispielsweise die ‚development evaluation' postuliert (Lam & Shulha, 2015; Patton, 1994). Bestrebungen, die Expertise von EvaluatorInnen für die Gestaltung der Instrumente und Programme – vor und während der Umsetzung – zur besseren Zielerreichung heranzuziehen, sind in diesem Sinne begrüßenswert. So gab das Bundesministerium für Klimaschutz, Umwelt, Energie, Mobilität, Innovation und Technologie zuletzt eine begleitende Studie in Auftrag, im Rahmen dessen ein umfassendes „Wirkungs*erreichungs*monitoring" für das missionsorientierte Programm „Mobilität der Zukunft" entwickelt werden soll. Dieses wird unter Einbindung von FördergeberInnen und FördernehmerInnen entwickelt und soll über das Förderprogramm hinaus eine konzeptionelle Grundlage für vergleichbare FTI-Programme bilden.

Zu guter Letzt möchten die AutorInnen noch das Verhältnis von FTI-Politik mit Umweltpolitik thematisieren, wobei ersteres schwerpunktmäßig durch die Missionsorientierung in Verbindung mit einer systemischen Herangehensweise zur Unterstützung der Realisierung die größten Potenziale haben dürfte. Darüber hinaus eindeutig noch wirkungsmächtigere Instrumente stellen Adaptionen im Steuer- und sonstigen Regulierungssystem dar, damit das Innovationsverhalten einer Volkswirtschaft in die richtigen Bahnen gelenkt werden. Dies kann FTI-Politik alleine nicht leisten.

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AUTOR:INNEN

HARALD WIESER
[KORRESPONDENZ]
KMU Forschung Austria
Gußhausstraße 8
1040 Wien
Tel: +43 1 5059761 - 27
E: h.wieser@kmuforschung.ac.at
ORCID: 0000-0002-5066-4214

PETER KAUFMANN
KMU Forschung Austria
Gußhausstraße 8
1040 Wien
Tel: +43 1 5059761 - 31
E: p.kaufmann@kmuforschung.ac.at

PHILIPP BRUNNER
Industriewissenschaftliches Institut (IWI)
Mittersteig 10/4
1050 Wien
Teil.: +43 1 513 44 11 2060
E: brunner@iwi.ac.at

WOLFGANG HAIDER
Zentrum für Soziale Innovationen (ZSI)
Linke Wienzeile 246
1150 Wien
Tel.: +43 1 495 04 42 18
E: haider@zsi.at
ORCID: 0000-0002-4744-8385

HARALD HOCHREITER
Österreichische Forschungsförderungsgesellschaft (FFG)
Sensengasse 1
1090 Wien
Tel: +43 1 57755 7024
E: harald.hochreiter@ffg.at
ORCID: 0000-0003-1230-8486

NORBERT KNOLL
Austria Wirtschaftsservice (aws)
Walcherstraße 11a
1020 Wien
Tel.: + 43 1 501 75 212
E: n.knoll@aws.at

LISA KOCH
Bundesministerium für Klimaschutz, Umwelt, Energie, Mobilität, Innovation und Technologie
Radetzkystraße 2
1020 Wien
Tel.: +43 1 711 62 65 2902
E: lisa.koch@bmk.gv.at

KLAUS KUBECZKO
Austrian Institute of Technology (AIT)
Giefinggasse 4
1210 Wien
Tel.: +43 50550 4566
E: klaus.kubecko@ait.ac.at

GERHARD REITSCHULER
Rat für Forschung und Technologieentwicklung
Pestalozzigasse 4 / D1
1010 Wien
Tel.: +43 1 713 14 14 14
E: g.reitschuler@rat-fte.at

SASCHA SARDADVAR
WPZ Research
Mariahilfer Straße 115/16
1060 Wien
Tel.: +43 1 890 32 25 203
E: sascha.sardadvar@wpz-research.com
ORCID: 0000-0001-6402-4405

KLAUS SCHUCH
Zentrum für Soziale Innovationen (ZSI)
Linke Wienzeile 246
1150 Wien
Tel.: +43 1 495 04 42 32
E: schuch@zsi.at
ORCID: 0000-0002-7603-4384

MARIO STEYER
KMU Forschung Austria
Gußhausstraße 8
1040 Wien
Tel: +43 1 5059761 - 21
E: m.steyer@kmuforschung.ac.at

practice paper

PARTICIPATORY APPROACHES IN RESEARCH, TECHNOLOGY AND INNOVATION (RTI) POLICY AND THEIR POTENTIAL IMPACT

JAKOB KOFLER, ELISABETH NINDL, DOROTHEA STURN AND MAGDALENA WAILZER

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ABSTRACT

The present article reviews various concepts of participatory science and research and discusses their potential to exhibit impact on the relationship between science and society. Starting with an overview of rationales, concepts and challenges, different forms and intensities of participatory approaches in research and innovation are discussed. We then look at the situation in Austria and sort selected Austrian funding programmes and initiatives into a diagram according to the intensity of participation as well as the social groups involved in each case. Finally, we try to gain more precise indications of the impact of participatory programmes on the relationship between science and society. Many questions remain unanswered, as precise analyses and evaluation results are usually lacking. While different surveys provide insights into society's level of information on a general level, interest, involvement and attitude towards science and research, approaches for impact assessment are fragmented and remain on the surface. We therefore propose to develop an analytical framework based on existing approaches and to include collaboratively developed indicators in it.

1 INTRODUCTION

This article is the result of one of three fteval working groups that were formed on the topic of research, technology and innovation (RTI) policy impact and regularly met from September 2020 to February 2021.[1] The topic of our working group was the impact of RTI policy on the relationship between science and society and we quickly agreed to focus on participatory processes. As a result of the working group, a blog post was created[2], which we also used to open up a space for further discourse. In doing so we followed three working hypotheses:

1. Participatory approaches have gained increasing attention on the policy level within the last years and they have the potential to directly affect the relationship between science, research and society.
2. There is no single public (society), but a plurality of different "publics'' on different topics or spheres. Different publics and groups require different formats of participation, interaction, cooperation, knowledge transfer and co-creation.
3. RTI funding programmes have the potential to influence the public understanding of science and research, as well as their relevance and responsiveness. However, it remains largely unknown what this influence looks like.

In the first section we present concepts of participatory approaches and highlight some philosophical and political rationales behind them, before we describe various forms of participation and focus on the degree of involvement of society in the second section. In the third section we summarise selected Austrian funding programmes and policies that connect science and research with the society. The fourth section addresses the need to learn about the potential impact pathways of such programmes and policies by suggesting the joint development of specific surveys and indicators. This effort could support the long-term goal of increasing the relevance, responsiveness and inclusiveness of science and research, as well as society's trust and empowerment in science and research.

2 RATIONALE AND CONCEPTS

2.1 RATIONALE BEHIND PARTICIPATORY APPROACHES IN RTI

In the last decades, the perception of societal outreach of research, technology and innovation has moved from an information-push oriented 'public understanding of science' approach (and the related deficit mod-

1 The fteval Working Group comprises: Carmen Calatrava (Technopolis), Anton Graschopf (RFTE), Erich Griessler (IHS), Jakob Kofler (KMU Forschung Austria), Patrick Lehner (LBG), Sabine Mayer (FFG), Elisabeth Nindl (FWF), Bettina Poller (RFTE), Barbara Streicher (ScienceCenter-Netzwerk), Dorothea Sturn (ZSI), Magdalena Wailzer (LBG), Isabella Wagner (fteval), Magdalena Wicher (IHS)

2 See https://www.fteval.at/content/home/news/ag_impact_results/AG-Impact_G2-Sci-Soc_Blogpost.pdf, April 26, 2021

el-thinking about the public) via 'science in society' to a 'science with and for society' understanding. RTI policy makers have come to realise that it is not enough to punctually involve societal stakeholders at later stages of RTI to ensure the best possible outcome and to mitigate risks. Instead, the involvement of broad societal groups has to be continuously ensured (Owen et al., 2012; Stilgoe et al., 2013; van den Hoven et al., 2013).

Unlike the traditional approaches to RTI in which researchers and innovators generate the ideas for projects, define the methods, generate results and interpret the outcomes, participatory approaches enable societal groups (users, stakeholders, civil society actors, citizens) to get involved, become a collaboration partner and shape the research agenda. Their participation should result in

- better public understanding of RTI, socio-political awareness and science literacy
- increased legitimacy of RTI policy interventions and co-ownership of society in science and research
- generating relevance, responsiveness and inclusiveness of RTI, ensuring that its outcomes align with the needs, values and expectations of society
- improved transparency and society's trust in science and research

2.2 CONCEPTS

Participation in science and research is debated, addressed and conceptualised in a multitude of research fields. In the following, we give a non-exhaustive overview on some of the key concepts and discourses offering frames to grasp the phenomenon. Note that there is considerable overlap between some of the concepts. The concepts in the following give a glimpse on the diversity of approaches to participation in research and are selected in terms of their overall relevance and their explanatory power for the present work.

Responsible Research and Innovation (RRI) is a key concept in EU-level discussions in this regard. The idea behind RRI is that societal actors and RTI actors become mutually responsive to each other (Von Schomberg, 2012), thereby co-creating solutions for which they share responsibility.

Apart from the RRI discourse, another strand of philosophical discussions on participation can be found in the **political philosophy literature** (cf. the special issue on participation in the journal Res Publica; Parvin and Saunders, 2018). Participation is commonly seen here as a direct corollary of democracy and widely supported at a principal or theoretical level.

The degree to which participatory processes are in line with democratic principles depends on their design. Philosophers identified a clear disconnect between the lived reality of participation, its underlying value of democracy, and its philosophical justification. Since the conditions for participation are sometimes too demanding and exclusive, participation practices can lead to an unfair concentration of power in the hands of a privileged, educated elite and would undermine the interests of disadvantaged groups who have not been able to engage in participation to the extent that wealthier people have (Brennan, 2016).

The issue of whom to engage gains even more importance when the power dimension of knowledge is considered. Habermas´ (1971) account on the notion of knowledge, – differentiating three main forms, instrumental, relational and critical knowledge – sheds light on the epistemological aspects of participation. Whereas instrumental knowledge is based on the natural sciences and a positivistic approach, relational and critical knowledge are constructivist concepts. This implies that relational and critical knowledge is collectively constructed by the people through social interactions. Acknowledging these forms of knowledge and their mutual interactions requires engaging with people and considering their local context and community (Park, 2005). **Participatory action research** can be seen as a movement emerging from these concerns, seeing knowledge produced by lived experience as equal to knowledge produced in academia (Torre, 2014).

One approach of public participation in science is **citizen science.** Looking at the development of this approach shows some of the key tensions of participation in research. In early works on the notion of citizen science, its double-sided nature as science for the people and science by the people was already highlighted. The former rests on political and epistemological aspects mentioned above. The latter refers to the educational purpose to integrate citizens in scientific endeavours as well as the usefulness of this kind of crowdsourcing to study particular phenomena. To date, most citizen science projects follow norms and values of institutional science, with the science by the people aspect being prevalent (Strasser et al., 2019). However, the science for the people aspect is gaining popularity and is more and more recognised in citizen science projects. Acknowledging this aspect requires considerably different project designs, making the whom and the how to engage major concerns (Mueller, 2012).

1.3 CONCERNS AND CHALLENGES

Participatory approaches in RTI activities are expected to better address socio-political issues and have more impact. In designing such formats, however, a number of potential difficulties and risks must be considered:

- Risks for researchers: The question of research quality[3] and the related problem of a loss of reputation are contradictorily discussed in the literature; it seems to be a feared rather than a real quality problem (Kosmala et al., 2016, Bone et al., 2012). There are also indications of possible career barriers for scientists, for example when participatory projects are seen as less important than classic journal articles or when junior scientist work is taken over by unpaid lay people (Riesch and Potter, 2014).
- Risks for participants: Their work is mostly unpaid and often not sufficiently appreciated (Jemielniak and Przegalinska, 2020). This lack of appreciation manifests itself, for example, in the fact that participants are often not named as co-authors or co-owners of outputs.
- In addition, there are a whole range of ethical risks to consider: Authorship and intellectual property rights, issues of human dignity, protection of privacy and data protection, transparency,

3 Data quality was almost universally recognised as one of the problems that scientists working in participatory processes need to address. Riesch and Potter (2014) presented a qualitative study of 41 semi-structured interviews with scientists working on the Open Air Laboratories project in England. They find that the major issues for researchers are the quality and accuracy of the data and worries about the reaction of the scientific community, such as journal reviewers.

inclusion, diversity and gender biases (see e.g. Bowser and Wiggins, 2015 or European Citizen Science Association, 2015).

3 FORMS AND INTENSITIES OF PARTICIPATION

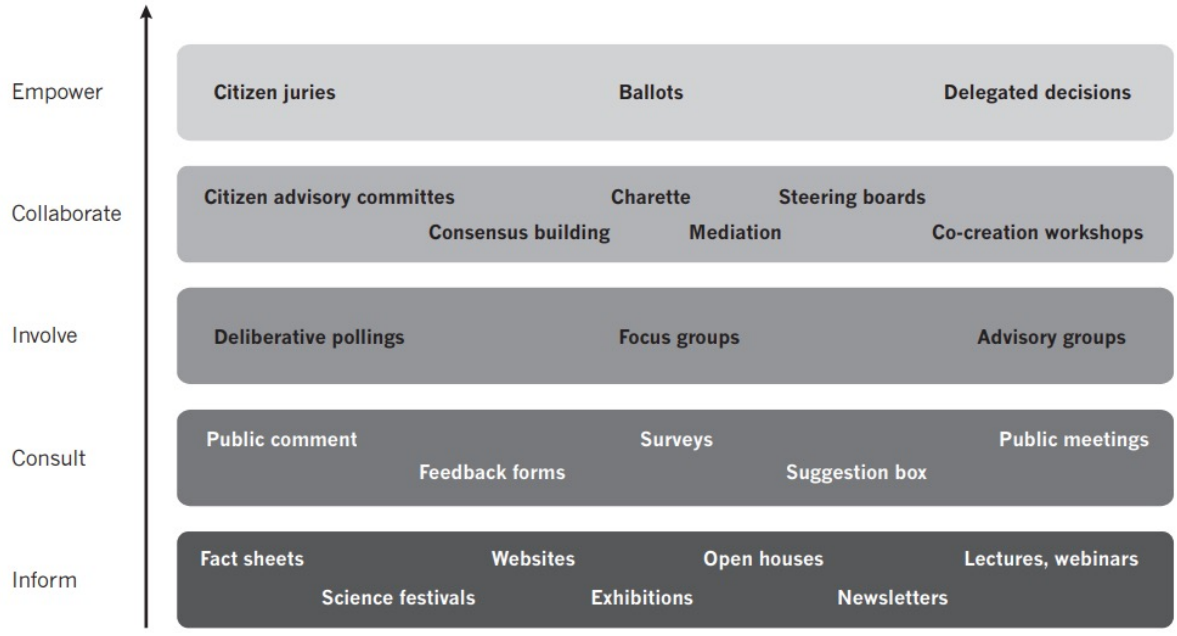
The decision on whom and how to involve different stakeholders, representing specific communities or society at large, depends on the purpose and context of the research endeavour (e.g. patients, family members, workers, members of an ethnicity or religion etc., Dryzek, 2012). The definition of the group of people to be involved in a participatory research project shapes its outcome. It determines who can participate and thus share his or her perspectives on a problem to be researched. This in turn determines not only the perceived legitimacy, but also the success of the participatory process. Were the appropriate groups involved to explore the research question holistically? For example, a research project that seeks to improve mental health support structures might have easy access to regular users and service providers, but may learn more from also engaging with non-users of the services to understand obstacles and barriers.

Finally, involvement of societal actors may not only take place in research projects along the research cycle (Hoekstra et al. 2020), but societal actors can also participate in decisions on framework conditions, such as the evaluation of project proposals or strategic decision-making and policy making processes. In these cases, questions of representation and power balance between interest groups gain further relevance and have to be reflected in the involvement process (Wynne, 2007).

When choosing the appropriate mechanism of public participation, it should be noted that the policy tools at hand largely differ in terms of the intensity of participant involvement. There are several approaches to conceptualise the different degrees of involvement: Arnstein (1969) developed a detailed typology of participation by identifying eight categories, visualised as spokes of a ladder, that differ according to the degree to which the society is engaged. She argues that the distribution of power is an essential part of participatory processes, determining its democratising and transformational potential. The ladder indicates the gradations of participation. In the following section, we use a simplified version of Arnstein's participation ladder to assess participation initiatives in Austria, the IAP2 Spectrum of Public Participation (2000). The typology defines the role of the public in participatory processes along the degree of power given to the public: the public is provided with information in the first mode *Inform*. In the second mode *Consult,* the public is asked for feedback, while in the third stage *Involve* partners work with the public throughout the process. The fourth stage *Collaborate* determines the public as a partner in all aspects of the decision. Finally, the stage *Empower* implies that the public makes the final decisions. The typology reflects that with higher degrees of involvement the empowerment of those who are affected by research increases, introducing a shift of power and ownership towards society.

In line with the degree of involvement, a specific format of interaction can be chosen. These formats or mechanisms of interaction are great in number and include citizen juries, expert advisory groups, patient and public involvement, consensus conferences, social labs and science shops, to name just a few. To design participatory processes, a variety of techniques can be combined (Rowe and Frewer, 2005). The appropriate mix of methods and the degree of engagement is highly goal and context dependent. While there is no standard typology of mechanisms nor a detailed guide which mechanism to use in what circumstances, Figure 1 provides an overview of exemplary techniques structured along the IAP2 typology:

Figure 1: Participatory techniques along the IAP2 typology



Note: The figure shows an adopted overview of methods grossly categorised to the IAP2 typology and the public engagement triangle (BIS, 2010). In practice, the design of the particular method determines the degree of participation; e.g. workshops could also be located in the Collaborate or Empower modes, depending on the degree of participation intended in the design of the workshop.

The design of the participation process also depends on the societal group to be involved and thus can influence participation structures (e.g.: meetings) and formats (e.g.: communication methods). For example, in the aforementioned research project on mental health support structures, some mental health patients struggling with stigma may hesitate to discuss certain topics in group settings and would feel more comfortable to share their perspectives in one-on-one meetings rather than co-creative workshops.

4 PARTICIPATORY RTI POLICIES IN AUSTRIA

4.1 RTI POLICIES TO SUPPORT PARTICIPATORY APPROACHES IN RESEARCH

Various research, technology and innovation policies aiming at governing and supporting the relation between science and society were established in Austria. Initiatives can be found on different levels using a variety of policy instruments. The initiatives cover a spectrum reaching from the creation of the Center for Citizen Science, the establishment of specific research funding programmes, the integration of science and society interaction formats into performance contracts with universities to programmes like the Kids University and events such as the researchers' night ("Lange Nacht der Forschung").

Strong impulses for public participation in science and research also came from Austrian research institutions that participated in and coordinated European Research projects (Framework Programme). The H2020 programme line "Science with and for Society" (SwafS) was and is critical for establishing a vibrant research community in the area of public engagement and RRI.[4] RRI aims at better aligning research and innovation with societal needs and promoting gender equality, public engagement, science literacy and science education, ethics and open access. The participation in SwafS projects also strengthened the connection of the Austrian research community with European and global networks and stimulated practice and debate of public engagement in Austria.

The SwafS programme supports university and non-university research institutes in experimenting with and promoting public engagement activities in research and innovation. Since 2014 it allocated in total 462 million Euro to science and society interactions, including public engagement and related topics. Austrian research organisations were very successful in this highly competitive programme: with a success rate of 19.2% (average 13.2%), they participated in 84 projects (37.2% of all projects), coordinated 21 of them (9.1% of all projects) and obtained funding of nearly 25 million Euro (7.2 % of total funding).[5]

In addition, Austrian funding agencies support and promote participatory approaches in science and research with designated funding programmes. The following section presents a brief overview of selected current or past funding programmes.[6]

4.2 SELECTED AUSTRIAN FUNDING PROGRAMMES

Benefit / AAL (Austrian Research Promotion Agency FFG)

The programme supports the involvement of end users (primary, secondary, tertiary)[7] in the development of ICT-based products and services with the aim of maintaining and improving the quality of life of older people and guaranteeing them the longest possible autonomous life. Since 2008, projects have been supported with over 70 million Euro. The relevant end users are involved in all stages of the research process by consultation, collaboration and co-creation. However, the focus in the AAL and benefit programmes is not just on users in the sense of consumers and their needs and wishes – instead, they are designed to help solving the key societal challenge of ageing by involving the relevant stakeholders. Hence, secondary and tertiary end users are highly relevant to pave the way to the successful implementation in a very sensitive and highly regulated market.[8]

#Connecting Minds (Austrian Science Fund FWF)[9]

The programme funds transdisciplinary research projects in a two-stage process. In the first stage, researchers and non-academic stakeholders (e.g., representatives of NPOs/NGOs, associations, public administration, firms, health and teaching facilities) develop a project idea (workshops funded with 10.000 Euro), in the second stage the full proposal is submitted. Funded projects receive 200.000 Euro annually for up to five years. The first call ended in spring 2020 with a total volume of four million Euro. The joint initiation and implementation of research processes by scientists and societal actors is expected to support the search for solutions to complex current issues, the transfer of (basic research) results into practice and to strengthen the dialogue between science and society. The involvement of society starts at a very early stage in the research process, is continued in the implementation and thereby supports the empowerment of the actors involved. The generous funding and the rather long project duration permit profound cooperation and co-creation.[10]

4 Under the lead of EU-Citizen.Science (http://eu-citizen.science/ April 22, 2021) 18 SwafS projects formed a network that regularly meets to discuss common challenges and widely disseminate key findings.

5 See: https://eu-pm.ffg.at/ui/login/, March 5, 2021.

6 Programmes are described in alphabetical order. Programmes that solely support citizens and patients taking part in research studies and clinical trials are not considered here. For information regarding evaluation reports of the programmes, please refer to 5. Uncovering the relationship between science and society.

7 As primary end users we understand citizens directly in their personal capacity, secondary end users are end user organisations' staff in their professional capacity, entities representing groups of persons, or networks of elderly people (family, friends, neighbourhoods...), tertiary end users are institutions such as insurances or communities.

8 See https://www.ffg.at/ambient-assisted-living-joint-programme and https://www.ffg.at/programm/benefit, April 22, 2021

9 The programme is funded by a special endowment from the Austrian National Foundation. At the time of writing, this endowment has expired, so that the continuation of the programme in 2021 and subsequent years is not secured.

10 See https://www.fwf.ac.at/de/forschungsfoerderung/fwf-programme/connectingminds, April 22, 2021

Innovationslabore (Austrian Research Promotion Agency FFG)

Innovation laboratories are structural measures to support the systematic and early-stage involvement of users in innovation processes (user-centred innovation). Introduced in 2016, they are utilised in thematically open calls or specific thematic fields (e.g. urban mobility lab), run up to a maximum of ten years and receive a funding of up to five million Euro (though most funding programmes use this instrument with less time and resources). So far, these infrastructures received funding of 29 million Euro. These laboratories are open for all – firms, research institutes, universities, communities, citizens, pupils etc. and thereby constitute a space for open innovation, that supports co-creation, the creation of a community and the transmission and transfer of know-how. They serve as platforms and provide infrastructure and services, where all interested parties can participate in co-creation processes, search for information and participate in collaboration and exchange. The broad range of offerings and the longer-term orientation enable multifarious forms of participation.[11]

PPIE – Public and Patient Engagement and Involvement (Ludwig Boltzmann Society LBG)

The PPIE programme is a top-up funding for citizen and patient participation activities in ongoing research projects, open to all disciplines. The funding amounts to 20.000-60.000 Euro for a duration of six to twelve months. The first call ended in October 2020 and has a budget of 600.000 Euro, the second PPIE call will open in autumn 2021. The ambition of PPIE lies in supporting the active participation of patients and the interested public in research processes to increase the quality and impact of the research, to ensure its societal relevance and to push innovation processes. The involvement of and collaboration with citizens and patients covers the whole research process, starting with the development of the research question. PPIE currently is the only programme in Austria that involves society in the funding decision already. Four representatives of the public, thereof one patient, one person from the field of public health and two young persons (16-25 years) with basic knowledge of scientific processes, are members of the panel.[12]

Sparkling Science (Austrian Agency for Education and Internationalisation OeAD)

Under the umbrella of Sparkling Science, funding programmes with calls between 2007 and 2016 and a total volume of 35 million Euro supported research projects with the aim of reducing structural barriers between the educational and the scientific system in Austria.[13] The participation of pupils in research projects should raise the interest of young people in research and science. The funding constitutes a top-up for ongoing research projects, mainly financed by other sources. The last projects ended in 2020. Overall, it was a wide-ranging programme with a large variety of different projects, many of them spanning over several years. Participation and success often critically depend on the engagement of teachers and schools, that enable and support participation.[14]

Top Citizen Science (Austrian Science Fund FWF)

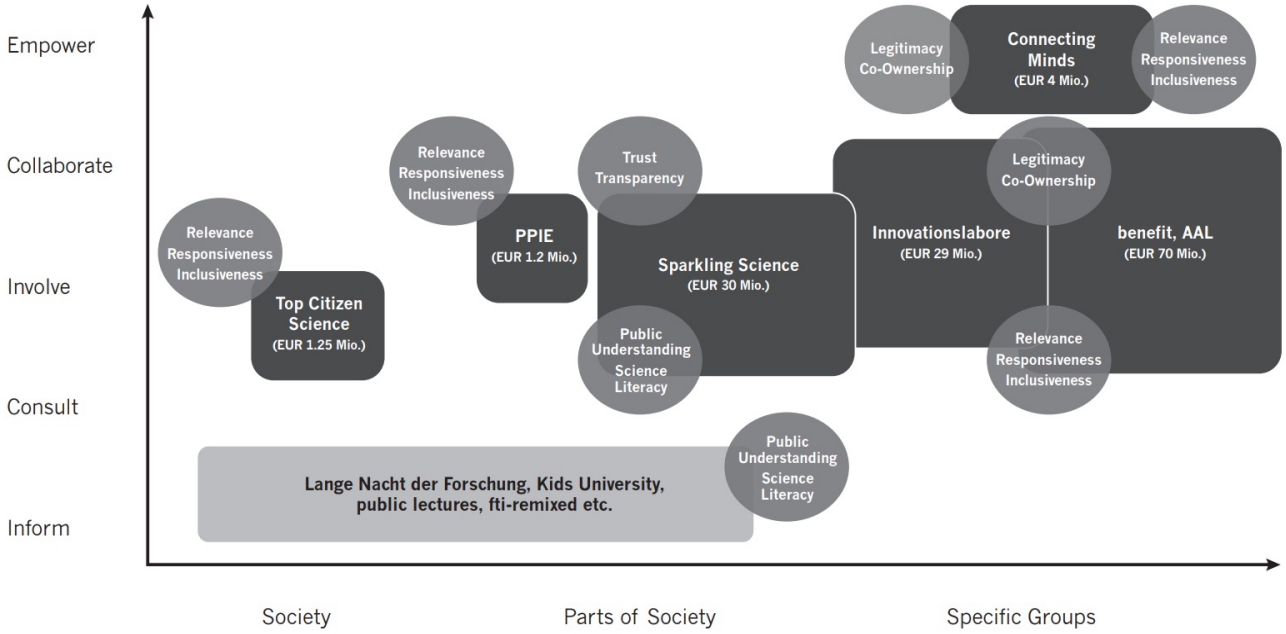
Since 2016, running FWF-funded projects can be augmented by citizen-science components. The funding per project amounts up to 50.000 Euro, the volume per call totals currently 250.000 Euro. The collaboration with citizens is expected to lead to a substantial, additional scientific knowledge gain in the research projects. Consequently, the programme targets citizens with highly specialised knowledge or expertise (knowledge communities), but also young target groups. The involvement in research is freely configurable, but due to the programme design it mostly consists of generation/collection and interpretation/analysis of data. As the award of funds is based on criteria of scientific excellence, the input of society in a research project needs to be relevant in order to achieve the desired excellent results.[15]

The abovementioned selected funding programmes supporting participatory approaches in research in Austria can be mapped according to the degree of involvement, the specificity of the society and the main rationale of the programme. While society is in very general terms understood as a group that interacts, in RTI policies the term more often refers to specific groups or parts of society, that are target groups for policy interventions (e.g.: pupils). In addition, societal groups often emerge and develop in the context of specific research questions or technological controversies.

The mapping in Figure 2 gives an overview and may serve as the basis for further discussions; it is not to be read as a ranking or rating, but instead solely aims at displaying a variety of programmes in Austria. It shall help locating the programmes in the space opened up by plotting aspects of society and participation, and to potentially allow identifying gaps in the present funding landscape.

11 See https://www.ffg.at/instrumente/Innovationslabor, April 22, 2021
12 See https://ppie.lbg.ac.at/, April 22, 2021
13 At the moment of writing, the relaunch of the programme was secured. Details will be published in the coming months.
14 See https://www.sparklingscience.at/, April 22, 2021
15 See https://www.fwf.ac.at/de/forschungsfoerderung/fwf-programme/foerderinitiative-top-citizen-science/, April 22, 2021

Figure 2: Mapping of selected Austrian funding programmes supporting participatory approaches in research



5 UNCOVERING THE RELATIONSHIP BETWEEN SCIENCE AND SOCIETY

As discussed above, specific RTI policies targeting the relation between science/research and society are expected to a) promote public understanding of science and increase science literacy, b) increase the legitimacy of RTI policy interventions and to support the co-ownership of society, c) raise the relevance, responsiveness and inclusiveness of science and research, and d) improve transparency and society's trust in science and research.

The funding programmes and policy measures introduced in the previous section address one or more of these points. However, the measurement of the effect or impact of those programmes on the four aspects mentioned in the previous paragraph is a difficult undertaking. Some of the abovementioned programmes have been evaluated in the recent past. However, the emphases of evaluation approaches across programmes differ greatly and the effect and impact of the programme on the relationship between scientific and societal actors is rarely explicitly considered. For example, Manahl et al. (2016) analyse the scientific output of "Sparkling Science" projects rather than effects of the projects on the relationship between science and society. They find that on average, 2.8 scientific articles, 0.8 university final theses and 0.3 school final theses resulted from each research project (211 projects in total), which is markedly lower than for FWF funded stand-alone projects. Meanwhile, some programme evaluation reports find positive effects on the cooperation and the exchange between partners from different societal, scientific, institutional and economic actors.[16] Tiefenthaler et al. (2018) find that the "Sparkling Science" projects increased the awareness and openness in schools (and to a lesser extent also in universities) for (internal) cooperation and exchange, and thereby inspired others to participate in such research projects. Researchers mention that the work with schools and pupils inspired their perspectives on and approaches towards their research (e.g. research questions). This increased openness may serve as a first indication for an improved relationship between science and society. However, as this was not the focus of the evaluation, this interpretation should be taken with caution. In fact, Tiefenthaler and Zingerle (2020) point out that impacts are difficult to assess for reasons such as the rather short time span between the introduction of the programme and the evaluation.

To measure the impact of participatory programmes on the relationship between science and society, different surveys have been introduced on a quite general level in order to give insights into society's level of information about science, its interest and involvement in science, and the attitudes towards science. Examples include the Eurobarometer surveys on Science & Technology[17] and on Responsible Research and Innovation[18], the German Science Barometer[19], the Open Science Monitor by the European Commission[20] or the U.S. Science and Engineering Indica-

16 Tiefenthaler and Zingerle (2020) evaluated urban mobility labs, which are realized in the framework of the instrument "Innovationslabore". Two evaluation reports on the institutional and scientific effects of the programme "Sparkling Science" were prepared by Tiefenthaler et al. (2018) and Manahl et al. (2016).
17 See https://data.europa.eu/data/datasets/s806_73_1_ebs340?locale=de April 27, 2021
18 See https://data.europa.eu/data/datasets/s1096_79_2_401?locale=de April 27, 2021
19 See https://www.bosch-stiftung.de/en/project/science-barometer-representative-survey-german-citizens-science-and-research April 27,2021
20 See https://ec.europa.eu/info/research-and-innovation/strategy/goals-research-and-innovation-policy/open-science/open-science-monitor_en April 27, 2021

tors[21] report on public attitudes. Moreover, the European Framework Projects MoRRI and Super MoRRI[22] provide a sound conceptual framework and associated methodology for the monitoring of the current state and evolution of responsible research and innovation and its scientific, social, economic and democratic effects, including the effects on the relationship between science and society. On a national level, Kieslinger et al. (2018) developed an evaluation concept for citizen science programmes and initiatives. According to this, citizen science programmes should be evaluated along three dimensions of participatory science: (i) scientific impact, (ii) learning and empowerment of participants and (iii) impact for wider society. The authors offer an open framework which can be adapted and tailored to the specific goals of citizen science programmes. The different surveys provide an impression of the current status of the relationship between science and society and its gradual change over time, but they do not provide in-depth insights into the factors shaping this relationship. As most surveys are conducted on a European level, they also do not allow conclusions for national programmes. However, a glimpse into existing evaluation reports of national programmes show a lack of focus on the relationship between science and society. Therefore, we see a potential for new approaches that enable us to deepen the understanding of the role that (specific) RTI policy measures can play in improving the relationship between science and society.

First, a survey[23] could be designed to gather information on programmes promoting public participation in science and research and to display their impact on the relationship between science and society. In addition to covering the relationship between society and science as a whole ("Did mutual acceptance, trust and credibility change?" etc.), the effects of these programmes on the representatives of (specific segments of) society (effects of participation on attitudes towards science and research, interests and behaviour) and on the representatives of science (effect of participatory practices on attitudes, behaviour and research) should be considered.

Second, in line with the goals of the funding programmes, corresponding indicators should be developed collaboratively by representatives of science and society and should be included in the evaluation protocols of the relevant programmes. A participatory indicator development for different types of funding programmes generates indicators tailored specifically to the goal and audience of these programmes. The collaborative development of the indicators itself sheds further light on the motivational factors and/or aspired impacts from scientific and societal actors, as well as potential divergences. At the same time, the indicators need to be comparable across programmes in order to allow policy makers to draw meaningful conclusions on output, outcomes and impact of such activities. This could build on existing efforts within the EU such as the SuperMoRRI project or the SwafS Project Co-Act where participatory approaches in the evaluation of citizen science are tested.[24]

6 CLOSING REMARKS

Participatory approaches, in various forms and intensities, have gained increasing attention within the last years through concepts such as RRI, participatory action research or citizen science. In RTI policies, participatory approaches have the potential to affect the relationship between science, research and society. Despite the advantages of these approaches, they also present challenges for researchers (e.g.: career barriers) and participants (e.g.: lack of appreciation), as well as ethical risks, such as authorship, protection of privacy, transparency and inclusion.

A closer look on the Austrian RTI landscape shows that some programmes supporting participatory approaches have been initiated, but many of them show untapped potential for further development. To advance these initiatives, not only the underlying aspirations and expectations of the programmes, but also their realised impact needs to be understood. While different surveys provide insights into society's level of information on a general level, interest, involvement and attitude towards science and research, approaches for impact assessment are fragmented and remain on the surface. We thus suggest to introduce more specific surveys at programme level that systematically gather the impact of participatory approaches on both, the participants and the researchers. Through a set of suitable and comparable indicators the effect of participatory science and research can be analysed in more detail. This in turn would allow the design of RTI policies that have the potential to truly shape the relationship between science, research and society in the long-run.

Science has the potential to tackle some of the grand challenges our society is facing. At the same time, however, science is also, at least in part, the source for some of these challenges. Therefore, the relationship between science and society has a political dimension and should be guided by realistic expectations, be mutually supportive and based on transparency, participation and mutual trust. In order to reflect these principles, RTI policy should aim to better align science and research with societal values, needs and concerns. To this end, programmes which encourage the integration of a wide range of societal actors along the whole research and innovation process should be more strongly promoted. This could not only increase the relevance, responsiveness and inclusiveness of science and research but could also promote the public understanding of and the trust in science and research.

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21 See https://www.nsf.gov/statistics/seind/ April 27, 2021
22 See http://morri-project.eu/ and https://super-morri.eu/ April 27, 2021
23 This survey should build on existing work and evaluation concepts such as Kieslinger et al. (2018) or Wiggins et al. (2018).
24 See https://coactproject.eu/what-is-coact/ April 27, 2021

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AUTHORS

JAKOB KOFLER
Austrian Institute for SME Research
Gußhausstraße 8, 1040 Vienna, Austria
E: j.kofler@kmuforschung.ac.at
ORCID: 0000-0002-6059-9989

ELISABETH NINDL
FWF – Austrian Science Fund
Sensengasse 1, 1090 Vienna, Austria
E: Elisabeth.Nindl@fwf.ac.at
ORCID: 0000-0002-2614-1974

DOROTHEA STURN
ZSI – Centre for Social Innovation
Linke Wienzeile 246, 1150 Vienna, Austria
E: sturn@zsi.at

MAGDALENA WAILZER
Open Innovation in Science Center, Ludwig Boltzmann Gesellschaft
Nußdorfer Straße 64, 1090 Vienna, Austria
E: Magdalena.Wailzer@lbg.ac.at

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RTI POLICY NOTE ON EVALUATING SOCIAL INNOVATIONS

JÜRGEN STREICHER, ANGELA WROBLEWSKI, KLAUS SCHUCH AND SYBILLE REIDL

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practice paper

ABSTRACT

Expectations of research, technology and innovation (RTI) policy are shifting towards effectively addressing major societal challenges. Due to its potential to increase innovative dynamics, to develop new knowledge and create new solutions, social innovation is increasingly promoted. This raises questions about (potential) effects and impacts of social innovation. The assessment of impacts is a rather new topic in this field, respective research is still in its early stages. This paper proposes to focus on the change of social practices within RTI ecosystems when assessing social innovation. The ecosystem approach is not only a helpful concept to analyse the emergence and diffusion of social innovation in a specific context, it can also be used to support and guide policy design. Implication for evaluation design are discussed and analytical categories presented. A set of measurement dimensions is proposed that can be used in evaluation designs and for future research.

INTRODUCTION

The challenges society is faced with, such as climate protection, energy supply, demographic change and social inequalities, require far-reaching changes and new approaches. Technological contributions will be important but may not be sufficient. Social innovations are seen as a complementary or even alternative way to address these issues and drive social change. Although social innovation is not a new concept (Howaldt and Schwarz 2010, Godin 2012, Moulaert et al. 2013, Howaldt et al. 2015), its application to tackle major societal challenges is increasingly encouraged and promoted.

Since 2009, social innovation has become a key topic at European level and within EU strategies, aiming to support smart, sustainable and inclusive growth. In the 2010s, social innovation was promoted by the European Commission through various policies and initiatives in several policy fields, such as social policy, research and innovation policy, health care and economic policy. Social entrepreneurship research and training was widely included in higher education curricula (Schuch 2021). Aside from a few theoretical and political questions which were aimed in particular at developing a universal definition as well as attempts to classify social innovation normatively and politically, the emphasis was primarily on practical application in various policy areas and the associated scale-up challenges.

A growing number of countries in Europe have adopted a social innovation perspective in research, technology and innovation (RTI) policy planning and strategies. While growth and competitiveness remain key objectives, RTI policy is expected to make significant contributions to solutions and transition paths addressing societal challenges too. RTI policy's engagement with transformative mission policies, which are no longer viewed solely in technological terms but more inclusively, was conducive in this regard. Resulting from this, new and creative ways of cooperation in science, business and society are increasingly promoted to address socio-technical challenges and to increase innovation dynamics even beyond traditional innovation agents such as academia and industry.

The uptake of social innovation in the realm of RTI policy has consequences for the reflection on the actual relevance of the concept in this policy field, its potential application areas as well as its outcomes and impacts. However, it seems that traditional evaluation approaches are not well suited for assessing the emergent dynamics and effects of social innovations. Apart from the diversity of concepts and definitions of social innovation, issues are the lack of knowledge regarding preconditions, potentials and hurdles for the development and diffusion of social innovation as well as the availability of relevant measurement dimensions. Reflecting on the long-term effects of social innovations is a new topic. Current research shows that assessments of social innovation in this regard have mostly been focusing on the immediate effects of individual projects or interventions as well as on benefits for organisations (Streicher 2020, Mildenberger et al. 2020), many of which are only loosely connected to RTI policy. Far less attention has been paid to long-term, overarching analyses of impacts.

This paper aims to extend the understanding of how RTI evaluations can capture the effects of social innovations better, which points are to be taken into account when assessing them and what might be further considered for future impact analysis. It builds on a discussion paper[1] that explores the potential impact of social innovations in the context of Austrian RTI policy. The paper at hand is structured as follows: First, the conceptualisation of social innovation in RTI is discussed; second, examples of RTI policies aiming to change social practices and corresponding examples of evaluation approaches are presented; third, implications for evaluation designs are addressed and potential measurement dimensions to be considered in evaluation designs are suggested; and finally, a conclusion and an outlook on future work is provided.

1 Working Group on Impact Assessment. Impact of RTI Policy on Social Innovation. Download: https://www.fteval.at/content/home/news/ag_impact_results/AG-Impact_G1-Blogpost_08032021_EN.pdf

CONCEPTUAL UNDERSTANDINGS OF SOCIAL INNOVATION

Despite significant attempts to establish a widely accepted definition of social innovation in recent years, the term is still conceptualised and defined in numerous ways by practitioners and researchers (e.g. Schuch and Šalamon 2021, Westley 2013). It is often understood as an umbrella term that encompasses "a very broad range of activity" (TEPSIE 2014), made up of specific social innovations, such as microfinance and fair trade, social entrepreneurship and social enterprise as well as newer approaches like social innovation labs and incubators (SiG 2016). In their review, Milley et al. (2018) concluded that social innovation is also referred to as a process of developing (creative) solutions to complex, multi-dimensional challenges. A corresponding highly cited definition of social innovation describes it as *"the development and implementation of novel interventions, processes, programmes, products or models to meet social needs"* (European Commission 2013, p. 6).

A great number of definitions and approaches convey a normative understanding of social innovations (Pol and Ville, 2009), ranging from narrowly defined application areas of human welfare enhancement (e.g. self-help groups of people with rare diseases) to new social transformative approaches to address pressing societal problems, such as the grand challenges (European Commission 2009, 2011). These problems are complex and feature substantial interdependencies among multiple systems and actors. Hence, social innovation may also produce unintended (negative) effects, which are rarely discussed ("dark side of social innovation", e.g. Larsson and Brandsen 2016, Mildenberger et al. 2020). Like technical innovations, social innovations can generate positive and negative, direct and indirect effects, and can lead to unintended or intended positive or negative consequences.

The way this paper approaches social innovation is by drawing attention to social practices, how they form and evolve, how they shape action such as participation and cooperation, and how they change ways of doing things. Howaldt and Schwarz (2010, p. 89) define social innovation as *"an intentional, targeted recombination or reconfiguration of social practices, which is attributable to certain actors or groups of actors in particular areas of action or social context, with the goal of solving problems or satisfying needs better than is possible based on established practices"*. The issues of context, here in particular referring to actors and interactions among them, as well as roles and structures are foregrounded. This makes social innovation more tangible in the RTI context, particularly for developing effective evaluation designs and facilitating the identification and measurement of related effects.

It is important to develop a profound understanding of the various aspects that shape social innovation performance. This means studying the different phases in which social innovation can play a role, i.e. from idea generation to systematic diffusion and scaling (Murray et. al 2010) in order to better understand and evaluate the processes involved. Differentiating social innovations from underlying technology-driven innovations presents a particular challenge. Social innovation can act as an enabler for technologies to become established or diffused (e.g. participatory design processes). Social innovation and technology can also depend on each other (e.g. car-sharing). Sometimes, technological advances are also a precondition and necessary tool for a new social innovation (e.g. 3D printers for do-it-yourself purposes or maker communities). Last but not least, social innovation may also work independently from any RTI developments. Such independent social innovations, however, are not in the focus of this paper.

A promising concept for innovation context analysis is the so-called ecosystem approach (Domanski et al. 2020, Terstriep et al. 2020, Domanski 2018a, Domanski 2018b). It is based on the assumption that new, application-oriented knowledge is, on the one hand, best generated through a multi-perspective approach in order to anticipate and avoid potential target ambiguities, usage conflicts, adaptation requirements and rebound effects. On the other hand, it allows for the highest possible matching of customer potentials and customer needs. Interdependencies and flows between actors are features of innovation ecosystems; roles, resources and structures are important analytical dimensions.

Social innovations affect or can originate from research and transfer processes and should be assessed against their background of emergence, i.e. their ecosystem. This helps to better understand and evaluate the processes involved, the conditions of success and failure, and how to shape ecosystems for social innovation. As stated in the underlying discussion paper, the formats and infrastructures that facilitate participation and interaction across research and transfer phases are of particular significance. Table 1 provides an overview of social innovation aspects that are currently identified or addressed by RTI policy making and lists potential evaluation foci. However, it is emphasised that social innovations are not only reinforced by stimulating ecosystems, but can contribute to (other) social innovations in RTI ecosystems themselves (see the following examples).

Table 1: Aspects of social innovation addressed by RTI policy in related transfer phases

Phase	RTI Policy	Evaluation foci
Research process	• Creating/directing/supporting thematic orientation and space (e.g. in calls), so that society (users, citizens, public and semi-public operators) can be more involved as innovation driver. • Offering participation formats (e.g. meetings, workshops, conferences). • Changing practice in the ongoing research process by interconnecting institutions, actors and stakeholders.	• Assessment of degrees of freedom, inclusion potential and regulation (incl. financial rules) in programmes and calls. • Implementation of participation formats • Timing/extent of involvement of relevant target groups (in research questions, design, etc.); • Immediate change(s) in the relevant target groups within the research process. • Infrastructures: What was made available to whom and when and how was it taken up and used? In which way should infrastructures be designed to enable and promote social innovation? • Relevance of networks (e.g. existing competencies, access to resources or people, leverage and multiplier effects).

Results (output, outcome) of the research process	• Changing behaviour in target groups confronted with research results (e.g. as products or services). • Uptake and use of results by society.	• Comparing the acceptance and usage of outputs by relevant target groups (pre-post comparison; with-without comparison). • Indirect changes within the relevant target groups, e.g. a change in social practice (long-term observation). • Spillovers to other social groups and initially non-targeted fields of application. • Spillovers and uptake by policy and regulation.
Feedback into new research processes and RTI policy	• Findings from the research process and (potential) behaviour change feed back into new research processes, measures, policies.	• Assessment of formats of feedback loops and level of involvement of participants therein. • Utilisation of results in future policies.

CHANGES IN SOCIAL RTI PRACTICES AND THEIR ASSESSMENT

In the following, three examples that illustrate aspects of social innovation currently addressed by RTI policy, and how they were evaluated, are briefly described. The first example is a programmatic social innovation that provides a supportive framework to incorporate the gender dimension into technology development. The second example is an organisational social innovation that has contributed to gender equality in university appointment processes. The third example is an institutional social innovation ecosystem approach that includes laypersons in the innovation process to better meet their individual needs. Overall, the examples show that RTI policy can act as an initiator of social innovation by facilitating changes in the organisation and implementation of research and innovation processes and the associated social practices.

Box 1: Changes of research processes and results in projects on equal opportunities

AIM OF RTI POLICY

Since 2008, the Austrian Research Promotion Agency (FFG) has been funding FEMtech research projects in research, technology and innovation to incorporate the gender dimension into technology development. With this funding line, the FFG aims to: (1) increase the acceptance of and interest in the topic of gender in research projects among researchers; (2) develop customised, innovative solutions that have a demonstration character and (3) increase the quality of technologies and products.

As part of an impact evaluation, a case study analysis showed increased gender competence of researchers, which is used to write better research proposals in FEMtech and in other funding programmes. Some research performing organisations established themselves as key players who have carried out several FEMtech research projects with alternating partners. They familiarised newcomers with including the gender dimension in their research to improve results. Overall, the quality of the submitted proposals and funded projects has improved substantially since 2008. (cf. Palmén et al. 2020)

EVALUATIVE APPROACH

The evaluation was designed with a mixed methods approach: In addition to the analysis of monitoring data at programme level made available by the FFG, a content analysis of the available project descriptions and a document analysis of former evaluations was conducted to identify outputs and outcomes of the funded projects. Moreover, qualitative interviews with representatives who have participated in three funded projects were carried out to gather more information about various kinds of effects of funded projects. The interviews enabled the evaluation team to capture qualitative outcomes and impacts of FEMtech research projects.

To identify whether the target of increasing the community of researchers who deal with the gender dimension in research was attained, a network analysis was performed. In addition, the interviews provided information about the impact the funding programme had on the level of the scientists' changing research practices and thus also with regard to their acceptance of taking the gender dimension into account in research.

Box 2: Changes of social practices in appointment procedures for full professors

AIM OF RTI POLICY

It is not only in science and research that the gender bias associated with selection processes for filling top positions is a central hurdle for women. Non-transparent decision-making processes or the existence of informal networks are stumbling blocks – even in formally regulated selection procedures.

One higher education policy programme that addressed this problem and aimed to trigger a change in traditional practices was the excellentia initiative (2007–2011) launched by the Austrian Federal Ministry of Science and Research (BMWF). Under excellentia, universities received a one-time bonus payment of up to € 70,000 for the additional appointment of women to professorships. The money paid out was to be used for gender equality measures. The bonus payment should initiate social innovation in appointment procedures. Specifically, the bonus was intended as an incentive for universities to reflect on existing regulations for appointment procedures with regard to gender bias and to develop alternatives. The evaluation of excellentia shows that this was the case at some universities and that an analysis of the appointment procedures was carried out to determine at which stages of the process the proportion of women decreases.

Based on these results, the processes were then adapted by, for example, defining binding evaluation criteria at the time the position was advertised. This was to avoid that criteria for individual applications were handled flexibly. In other cases, informal practices were formalised to reduce the influence of existing informal networks on the appointment process. (cf. Wroblewski 2015, 2014)

EVALUATIVE APPROACH

The evaluation design comprised an ongoing implementation evaluation as well as an ex-post evaluation of the programme impact. Evaluation results feed into programme implementation via interim reports and stakeholder workshops. The evaluation provided information on progress regarding the development of alternative social practices in appointment procedures already in interim reports to facilitate programme adaptation.

The evaluation was based on a mixed methods approach and focused on two impact dimensions: (1) the share of female professors and (2) the development of unbiased appointment procedures. Quantitative data was used to analyse women's participation in different stages of appointment procedures (applicants, hearing, shortlist) as well as the development of the share of female professors.

Case studies were conducted to analyse the appointment procedures regarding potentially gendered practices and the awareness of members of appointment committees and the rectorate regarding gender bias in appointment procedures. The case studies were based on the analysis of documents and guidelines defining the appointment procedure for full professors. Moreover, interviews with members of appointment committees and the rectorate were conducted to capture the change of social practices in appointment procedures and to analyse their awareness regarding gender bias in the procedure as well as how they interpreted und implemented guidelines.

Box 3: Changes of research processes and social practices through the maker movement

AIM OF RTI POLICY

"Maker spaces" and the "Do-it-yourself movement" can be seen as social innovations within the RTI actor landscape. The RTI policy objective associated with the support of maker spaces is, firstly, to enlarge the innovation base by involving laypersons in practical technology development by supporting specific infrastructures. Secondly, these maker spaces serve to create very specific products and product designs the market has no corresponding offer for. Thirdly, a positive connotation and low-threshold access to technology should be propagated.

Open physical workshops (i.e. maker spaces) equipped with new (e.g. 3D printers) as well as traditional tools and technologies enable a bottom-up development of ideas into prototypes. Suggestions usually come from society and the maker population itself, and are put into practice by the steadily changing maker population under the guidance or with the help of the community. To secure their functionality, maker spaces are "curated", i.e. organised and supervised. Maker communities build "collective intelligence" so that innovative ideas of civil society actors (individual citizens as well as formal and non-formal groups of citizens) are not abandoned for lack of know-how.

EVALUATIVE APPROACH

As of project inception, it was planned to monitor the performance of the CAREABLES project, evaluate the expected outcomes and assess its potential impact. A set of monitoring criteria and impact metrics was developed at the initial stage of the project. For the appropriate data collection, a set of quantitative and qualitative data collection instruments was developed to evaluate the project's performance at different points in time (Schaefer et al. 2018).

The objectives of the evaluation centred on (i) how the accessibility of the CAREABLES platform for open-source products could be improved, (ii) how well knowledge exchange worked and on the quality of collaboration, (iii) how documentation and replicability worked, (iv) and in how far the quality of life for people with special needs could be improved. The evaluation approach was based on a literature review and theoretical assessment of how to evaluate participatory co-design projects and collective awareness platforms (CAPs).

A special evaluation emphasis was on assessing the collaborative processes involved in the co-design of open healthcare as well as the potential of the developed CAREABLES platform, which was designed for documentation and sharing of open healthcare solutions. For the

The maker community is thus a new social practice for generating innovations, especially in the field of design and technology.
An example of a maker community is the H2020 project CAREABLES (https://www.careables.org). The project is integrated into decentralised infrastructures ("maker spaces" in various European countries) and networks them around a common goal: the creation of open, inclusive and digitally supported health products together with the people concerned. Different (offline, online) formats and events are offered in which people with special needs work together with so-called "makers" (often creative thinkers, hobbyists). In the project, the methodology for the co-design of the products is developed and the cooperation is accompanied. Interested parties can download detailed documentation on individual "careables" via the CAREABLES platform, adapt and further develop them. A positive side effect of the cooperation with makers is the experience of self-empowerment and appreciation among those affected, which improves their quality of life.

latter, indicators of usability and user experience were used. The methods for that included "think aloud", interviews, surveys, cognitive walk-throughs, logging data, etc. It could be demonstrated that some CAREABLES were diffused to other continents and significantly scaled-up. For knowledge exchange and quality of cooperation, multiple methods were used, including live-event evaluation cards (feedback), a focus group, and platform usage statistics. As regards the personal and social impact (i.e. quality of life), interviews and storytelling methods were applied.

EVALUATING SOCIAL INNOVATION

As shown by the examples above, the complexity of social innovations needs to be adequately dealt with in evaluation designs. Traditional evaluation approaches do not take specificities of social innovation into account appropriately (e.g. Preskill and Beer 2012, Weaver and Kemp 2017, Milley et al. 2018). Especially standard economic methods are criticised for not reflecting the full value of social effects that cannot be monetised or are difficult to monetise (Weaver and Kemp 2017, p. 10). One key issue raised in the evaluation literature is that mixed-methods approaches, tailored to purpose and context, which can potentially consider quantifiable (tangible, monetised) as well as qualitative outputs and outcomes that cannot be expressed in monetised forms are necessary to account for the complex nature of social innovations. The developmental evaluation approach formulated by Michael Quinn Patton (2011) is another frequent approach. Developmental evaluation *"seeks answers to questions that are relevant to innovation, by helping social innovation actors to take a broader systems perspective and help them navigate (inherently uncertain and judgement-based) processes of change, by making them reflect on their assets, their theory of change and the opportunities and dangers afforded by a changing context"* (Weaver and Kemp 2017, p. 4).

Developmental evaluations in the field of social innovation are based on the principles of participation, utilisation and reflexivity. To meet these expectations, a "fit-to-purpose" participatory approach is suggested which aims at establishing a collaborative structure between evaluators and relevant stakeholders. This collaboration should support mutual learning throughout the evaluation process. Hence, the evaluator acts as a strategic learning partner, a facilitator or a "critical friend" (Rallis and Rossmann 2000, Balthasar 2012) for reflexive processes. Furthermore, the evaluation design should be flexible to respond to emerging issues and questions in the course of the innovation process.

In Table 2, categories of participation, interaction and technology integration are presented that should be considered when developing the evaluation design focusing on the effects and impacts of social innovation in the context of RTI. The targeted change of social practices may lead to different impacts like increasing citizenship or stakeholder participation in research and innovation processes, contribution to inclusive societies, a change of the political discourse or the adaptation of social practices through technological developments. Likewise, technology development and social innovation can go hand in hand through co-development processes. Technology can also be developed or adapted and used specifically for the deployment of social innovations.

The early involvement of relevant target groups in research processes, the joint formulation of problems, and the observation of changes in the target groups are important. Such changes in the research process as well as increased support from RTI policy for technologies that generate or enhance desired social innovations can lead to more inclusive and society-relevant research outputs. The table summarises potential goals of RTI policy and possible dimensions for measurement to be considered in evaluation designs. Ideally, the evaluation should capture individual level change as well as collective and systemic changes.

Table 2: Categories, goals and measurement dimensions

	Goals of RTI policy	Evaluation design	
		Qualitative dimensions	Quantitative dimensions
Participation	• Identification of new target groups • Involvement of relevant target groups, including civil society actors, NPOs, public and semi-public institutions that enhance welfare	• Characteristics (type, structure) of target groups • Relevance and form of involvement	• Number and socio-demographic structures of participants from relevant target groups • Extent, duration of involvement of relevant target groups (e.g. in research design) • Number of projects involving relevant stakeholders
	• Establishment of incentive systems for increasing the willingness to contribute to social innovations in exchange of science and practice, and/or • Development of (funding) measures that require or presuppose the participation of specific actors in RTI	• Concepts and programme theory of initiatives implemented • Participation behaviour • Role and extent of inter- and transdisciplinarity • Development of and participation in networks • Type and purpose of outputs and outcomes (concepts, products, processes, services, changed framework conditions, changed regulations, changed policies) • Uptake of measures by target groups (e.g. specific application cases)	• Number of measures (size of funding programmes, competitions, available budgets; input additionality, etc.) • Frequency and distribution of inter- and transdisciplinarity • Frequency and distribution of various types of links and relationships in networks • Number of outputs, outcomes (concepts, products, processes, services, changed framework conditions, changed regulations, changed policies) • Number of people affected by these outputs and outcomes • Resources spent on coordination and monitoring
	• Creation, provision of participation formats • Provision of joint infrastructures (testing environments, experimental laboratories, social labs)	• Forms of participation • Purpose, acceptance and usage of infrastructure • Participation behaviour • Efficiency and flexibility of implementation	• Resources spent on setting up and operating a facility • Number of formats, infrastructures • Update of formats, infrastructures
Inclusion	• Consideration of diversity in society • Promotion of participation, equal opportunities, gender equality • Empowerment of individuals • Capacity building of organisations	• Qualitative actor feedback • Self-description of actors pre/post (e.g. encouragement, inspiration, appreciation, competence development) • Visibility of participation	• Level of actor satisfaction • Number of actors who feel empowered • Number of actors who built up capacity
Changes in discourse	• Opening up new topics, perspectives • Changes in social interaction • Contribution to acceptance, dissemination and institutionalisation of social innovation	• Development of new, improved competences, knowledge • Intensified networking • Changes in the population (e.g. attitude towards science)	• Number, share of people with new/improved competences, knowledge • Links and relationships in networks • Number, share of people who have changed their attitude
Level and added value of technology integration	• Enabling new social practices through adequate technology input • Enabling technological diffusion through supportive social innovations • Co-design and mutually supportive co-development of new technologies and social innovations	• Case studies in relation to • reinforcement effects, • acceptance, • innovation content (scope and scale) • Contribution to social welfare in the broadest sense	• Speed of innovation, diffusion rates (roll-out) • Scale of social diffusion, levels of social acceptance, accessibility and affordability • Number of adoptions and adaptations in different regions, contexts or by different stakeholders (scaling-up)

CONCLUSION

Social innovations are more frequently being addressed in RTI policy. This raises questions about (potential) effects and impacts of social innovation. However, assessments of impacts is a new topic in this field, respective research is still in its early stages. While RTI policy has seen rapid developments in impact evaluations of technology and innovation promotion, it lacks understanding of the processes of social innovation and their effects, let alone a systematic approach to assess them.

To make social innovation more tangible in the RTI context, this paper proposes to focus on the change of social practices within RTI ecosystems when assessing social innovation. The ecosystem approach is considered a helpful concept to analyse the emergence and diffusion of social innovation in a specific context and to explore factors and mechanisms that shape success and failure, effects and impacts. Ideally, the ecosystem approach should not only be used for the evaluation of social innovation, but also to support and guide policy design. Thinking about and outlining expected impacts already when conceptualising the policy lays the groundwork for later evaluations.

For a context-aware evaluation design, the paper suggests drawing attention to the different phases of research and innovation in which social innovation can play a role. Particularly important are the formats and infrastructures that facilitate participation and interaction across research and transfer phases. To account for the complexity of social innovations adequately, a "fit-to-purpose" participatory approach is suggested that aims at establishing a collaborative structure between evaluators and relevant stakeholders and at advancing the learning experiences for everyone involved. Evaluation designs should consider categories of participation and inclusion, interaction and integration using qualitative and quantitative data. As a major contribution of this paper, a set of measurement dimensions alongside these categories is proposed that can be used for future work. In a next step, concrete indicators are to be developed in a systematic way, enabling long-term monitoring and comparison of social innovations.

In past RTI evaluations, little to no attention was paid to the question of social innovations that were triggered, reinforced or changed by technological developments or research. However, an increasingly mission-oriented RTI policy must address this and RTI evaluations dealing with transformative mission-oriented RTI policies need to expand knowledge about the effects of social innovation.

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AUTHORS

JÜRGEN STREICHER
Joanneum Research
Sensengasse 1, 1090 Wien
E: juergen.streicher@joanneum.at
ORCID: 0000-0002-1836-0149

ANGELA WROBLEWSKI
Institut für Höhere Studien
Josefstädterstraße 39, 1080 Wien
E: wroblews@ihs.ac.at
ORCID: 0000-0002-1233-4409

KLAUS SCHUCH
Zentrum für Soziale Innovation
Linke Wienzeile 246, 1150 Wien
E: schuch@zsi.at
ORCID: 0000-0002-7603-4384

SYBILLE REIDL
Joanneum Research
Sensengasse 1, 1090 Wien
E: sybille.reidl@joanneum.at
ORCID: 0000-0001-6453-5926

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INTERNE EVALUIERUNG IM ÖSTERREICHISCHEN FORSCHUNGSBEREICH

RÜCKSCHAU UND REFLEXION ZUR FTEVAL TAGUNG "VERBINDLICHKEIT IN DER INTERNEN EVALUIERUNG"

ISABELLA WAGNER, ELISABETH FROSCHAUER-NEUHAUSER AND KATHARINA WARTA

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event review

KURZFASSUNG

In diesem Beitrag wird die Diskussion der fteval Tagung "Verbindlichkeit in der internen Evaluierung", die am 30. November 2020 online stattgefunden hat, eingefangen. Der analytische Rahmen wird vertieft und verschiedene Aspekte interner Evaluierung reflektiert. So wird interne Evaluierung als Prozess verstanden, unterschiedliche Schwierigkeiten nach ihrer Durchführung und ihrem Zentrum der Verantwortung (jeweils intern oder extern) betrachtet und diese Überlegungen in den Kontext der Beispielfälle der Tagung eingebettet.

ABSTRACT

With this contribution, we want to wrap up the discussions during the fteval symposium "Commitment in Internal Evaluations" that took place on-line on 30 November 2020. We present and further elaborate the analytical framework used and reflect on different aspects of internal evaluation. By understanding internal evaluation as a process, and observing differences depending on the main responsibility and way of execution (internal or external), we put our reflexions in context with the examplary cases presented at the symposium.

EINLEITUNG

Im Bereich der Forschungs- Technologie- und Innovationspolitik (FTI-Politik) ist die Evaluierung von Programmen und Instrumenten gut etabliert. In Österreich legen allgemeine gesetzliche Erfordernisse, spezifische Anforderungen im Kontext von Richtlinien und Fördertätigkeiten sowie haushaltrechtliche Maßgaben die Durchführung von Evaluierungen fest. Wie die im Jahr 2019 im Auftrag der fteval durchgeführte Marktstudie zeigt, handelt es sich hierbei so gut wie ausschließlich um externe Programmevaluierungen, während Institutionen und Organisationen (aber auch gesetzliche Regelungen) eher selten evaluiert werden (Streicher et al., 2020). Aus Erfahrungsberichten ist bekannt, dass strukturierte interne Evaluierungen im Bereich der Forschungs- und Technologiepolitik selten sind, auch wenn insbesondere Förderagenturen durchaus interne Untersuchungen zur Wirksamkeit bestimmter Maßnahmen und Instrumente durchführen.

Was sind nun interne Evaluierungen? Die DeGEval definiert in ihren Standards eine Evaluation als intern, wenn die Evaluierenden derselben Organisation angehören, die auch für den Evaluationsgegenstand verantwortlich ist. Diese kann als Selbstevaluation oder „in-house Evaluation"[1] realisiert werden. Bei einer Selbstevaluation evaluieren die Personen, die einen Gegenstand entwickeln und/oder umsetzen, diesen selbstverantwortlich und eigenständig und sind sich häufig auch selbst Auftraggebende. Bei einer in-house Evaluation fallen Programmverantwortung und Evaluierende auseinander, wobei aber noch immer alle beteiligten Personen derselben Organisation angehören. Bei einer externen Evaluation sind die Evaluierenden nicht Teil derselben Organisation. Wir werden im Folgenden auf die genannten Differenzierungen und etwaige Überlappungen eingehen.

Interne Evaluation stellt eine strukturierte Reflexion und Auswertung zur Erfolgskontrolle der eigenen Aktivitäten ins Zentrum – in Bezug auf eigene oder die mit Auftraggebenden definierten Ziele, sowie zur Weiterentwicklung der eigenen Institution und ihrer Aktivitäten. Bei der Darstellung von Wirkungen und der Qualität der eigenen Arbeit hat eine interne Evaluierung im Vergleich zur externen Evaluierung Informationsvorteile, Aufgabe ist auch hier, dies strukturiert und nachvollziehbar darzustellen, nach innen oder außen (oder beides). Die Prozesse der Umsetzung der Empfehlungen sowie die Überprüfung dieser Umsetzung sind vielfältig. Sie hängen nicht zuletzt davon ab, ob Evaluierungsergebnisse oder die Umsetzung von Empfehlungen bzw. Auflagen in Verbindung mit Finanzierungszusagen stehen, oder ob eine Evaluierung in erster Linie formativ angelegt ist, also der Information und dem Lernen dient. Aspekte wie Objektivität, Validität, Reliabilität, Transparenz, Verlässlichkeit in Bezug auf die Umsetzung, sowie Verwertung und Reflexion der Ergebnisse stehen bei internen Evaluierungen jedenfalls auf dem Prüfstand.

In diesem Beitrag gehen wir der Frage nach, in welcher Weise es einen Unterschied macht, ob man sich bei einer internen Evaluation vor sich selbst oder einer Instanz von außen erklärt und wer die Evaluierung durchführt. Wir beziehen uns hierbei in erster Linie auf die Ergebnisse einer online-Veranstaltung, ergänzt durch Literatur sowie Erfahrungen aus dem universitären Hochschulsektor, in dem interne Evaluierungen einen anderen Stellenwert haben als in der Programm-basierten FTI-Förderung. Aus der anregenden Diskussion der fteval Tagung „Verbindlich-

1 In den DeGEval Standards werden diese „in-house Evaluationen" als Fremdevaluationen bezeichnet.

keit in der internen Evaluierung“ [2] schöpfend, entstand dieser Artikel als Rückschau, vertiefende Reflexion und in Bezugnahme auf den österreichischen Kontext. Das Autorinnen-Trio besteht aus der federführenden Veranstalterin an der fteval (Isabella Wagner), der ehemaligen Obfrau der fteval und Initiatorin der Tagung (Katharina Warta, Technopolis) sowie Elisabeth Froschauer-Neuhauser (AQ) als maßgeblich Mitwirkende an der Sonderausgabe des fteval Journals zu Hochschulevaluierung (Nr. 49). Im Rahmen der Tagung wurden gemeinsam mit ausgewählten Vortragenden der Alexander von Humboldt-Stiftung (AvH), des Instituts für Höhere Studien (IHS) und der Ludwig Boltzmann Gesellschaft (LBG) sowie Discussants der Universität Wien, der Christian Doppler Forschungsgesellschaft (CDG) und des Wiener Wissenschafts-, Forschungs- und Technologiefonds (WWTF) die Besonderheiten interner Evaluation beleuchtet und Beispiele erfolgreicher Umsetzungen diskutiert. Folgende Themen leiteten den Erfahrungs- und Wissensaustausch:

Wert interner Evaluierung

- Spannungsfeld zwischen Objektivität und interner oder externer Vereinnahmung
- Spannungsfeld zwischen Lernen / Entwicklung und Rechtfertigung
- Zugänglichkeit von Daten und Ergebnissen, Ownership der Evaluierung, Transparenz
- Anonymisierung der Daten - Offenheit der Ergebnislegung
- Aufwand und Budget (personelle und finanzielle Ressourcen) von internen und externen Evaluationen

Risken bzw. Herausforderungen der internen Evaluation und der Selbstevaluierung im Speziellen

- Unabhängigkeit und Unparteilichkeit der Evaluator*innen, oder blinde Flecken
- Abgrenzung zu sonstigen Reflexions- und Organisationsentwicklungsformaten
- Aufwand für die Evaluierung, insbesondere bei Selbstevaluierungen, Wahrnehmung von Evaluierung als Belastung statt als Unterstützung, Widerstände
- Unterschiede im Umgang mit Transparenz und etwaigen Machtverschiebungen und ihre Konsequenzen auf die Dynamik einer internen Evaluierung
- Verbindlichkeit in der Umsetzung der Empfehlungen
- Bevor wir auf konkrete Erfahrungen eingehen, stellen wir im kommenden Abschnitt ein Modell als Basis zur Differenzierung unterschiedlicher Evaluierungssettings vor.

AUSPRÄGUNGEN INTERNER EVALUIERUNG

Um ein gemeinsames Verständnis der verschiedenen Ausprägungen interner Evaluierung zu generieren, wurde eine zweidimensionale Matrix nach Durchführung und dem Schwerpunkt der Verantwortung erstellt, wobei beide Achsen jeweils die Tendenz beschreiben, ob die Aktivität/Verantwortung innerhalb oder außerhalb des Evaluationsobjekt liegt. Die horizontale Achse der Durchführung betrachtet, ob die Evaluation innerhalb einer Institution durchgeführt wurde, oder (auch) durch externe Evaluator*innen bzw. durchführende Agenturen. Wie bereits erwähnt, wird bei der Durchführung innerhalb derselben Organisation nur dann von “Selbstevaluation” gesprochen, wenn die Evaluierenden gleichzeitig für den Evaluierungsgegenstand zuständig sind.

Die vertikale Achse hat mehrere Bedeutungsebenen: sie stellt die Zielgruppe dar, die Frage, an wen sich die Evaluierungsergebnisse richten, wer das „Gegenüber“ der Evaluierung ist und wer letztendlich für die Umsetzung der Evaluierungsergebnisse verantwortlich ist. Diese Position kann mit der Beauftragung zusammenfallen, aber auch mit einer Instanz, gegenüber der es gilt, die eigenen Tätigkeiten darzustellen, oder gar rechtzufertigen. Umgekehrt dient eine vorrangig nach innen gerichtete Evaluation eher dem organisationalen Lernen, die Berichte stehen dementsprechend kaum der Öffentlichkeit zur Verfügung. Diese Achse beschreibt also die Lage der Verantwortung im Spannungsfeld Evaluierungsobjekt, Durchführende und Beauftragende.

Die räumliche Darstellung verdeutlicht, dass es in der Regel Mischformen gibt. Es entstehen vier Quadranten (Abbildung 1), die jeweils unterschiedliche Ausprägungen beschreiben:

- **Durchführung und Verantwortung intern**: Bei interner Beauftragung und interner Durchführung spricht man von “Selbstevaluation”, wenn die Evaluierung durch die für den Evaluationsgegenstand zuständigen Personen durchgeführt wird. Ebenfalls intern, aber durch z.B.: eine andere Abteilung (z.B. Qualitätssicherung) durchgeführt, wird die Evaluierung als in-house Evaluierung bezeichnet.
- **Durchführung intern – Verantwortung extern**: Es gibt unterschiedliche Ausprägungen, wie externe Elemente in der internen Evaluierung eine Rolle spielen. So kann etwa die Beauftragung von einer Instanz außerhalb des Evaluationsgegenstandes kommen und die Durchführung intern abgewickelt werden. Das könnten etwa Monitoring-Aktivitäten sein, die einer auftraggebenden oder fördergebenden Institution vorzulegen sind, was beispielsweise an den österreichischen Universitäten im Zuge der individuellen Leistungsvereinbarungen mit dem Ministerium der Fall ist. Ebenso fallen Selbstevaluierungsberichte in diese Kategorie, die im Rahmen einer externen Evaluierung und nach Vorgaben, entlang von Fragen des externen Evaluierungsteams erstellt werden.
- **Durchführung extern – Verantwortung intern**: Die andere Variante, sich externer Akteur*innen zu bedienen, ist wenn zwar Eigeninitiative/Selbstbeauftragung die Evaluation initiiert, aber die Durchführung der Evaluierung (teilweise) an externe Expert*innen vergeben wird. Das ist beispielsweise der Fall, wenn die Daten intern gesammelt, aber ein externes Expert*innengremium zur Auswertung engagiert wird. Die Entscheidung über die Nutzung und Verbreitung der Evaluierungsergebnisse liegt in der Organisation, die für den Evaluierungsgegenstand zuständig ist (“Ownership”).
- **Durchführung und Verantwortung extern**: Wenn sowohl die Verantwortung als auch die Durchführung außerhalb der evaluierten Institution liegen, spricht man von einer externen Evaluierung. Dennoch sind die Evaluationsobjekte aktiver Bestandteil der Evaluierung und die Konsequenzen betreffen immer auch

2 Online-Tagung am 30. November 2020, siehe https://fteval.at/content/home/veranstaltungen/veranstaltungen/tagung_interne_evaluation/

interne Prozesse. Die Organisation hat in der Regel Daten bereitzustellen und ist dadurch mit einem gewissen Aufwand konfrontiert. Viele Programmevaluationen fallen in diese Kategorie. An den österreichischen Universitäten und Fachhochschulen zählen z.B. auch die Audits dazu, wo der Fördergeber (das Ministerium) per Gesetz vorgegeben hat, dass das interne Qualitätsmanagement regelmäßig einer Evaluation durch externe Agenturen zu unterziehen ist.

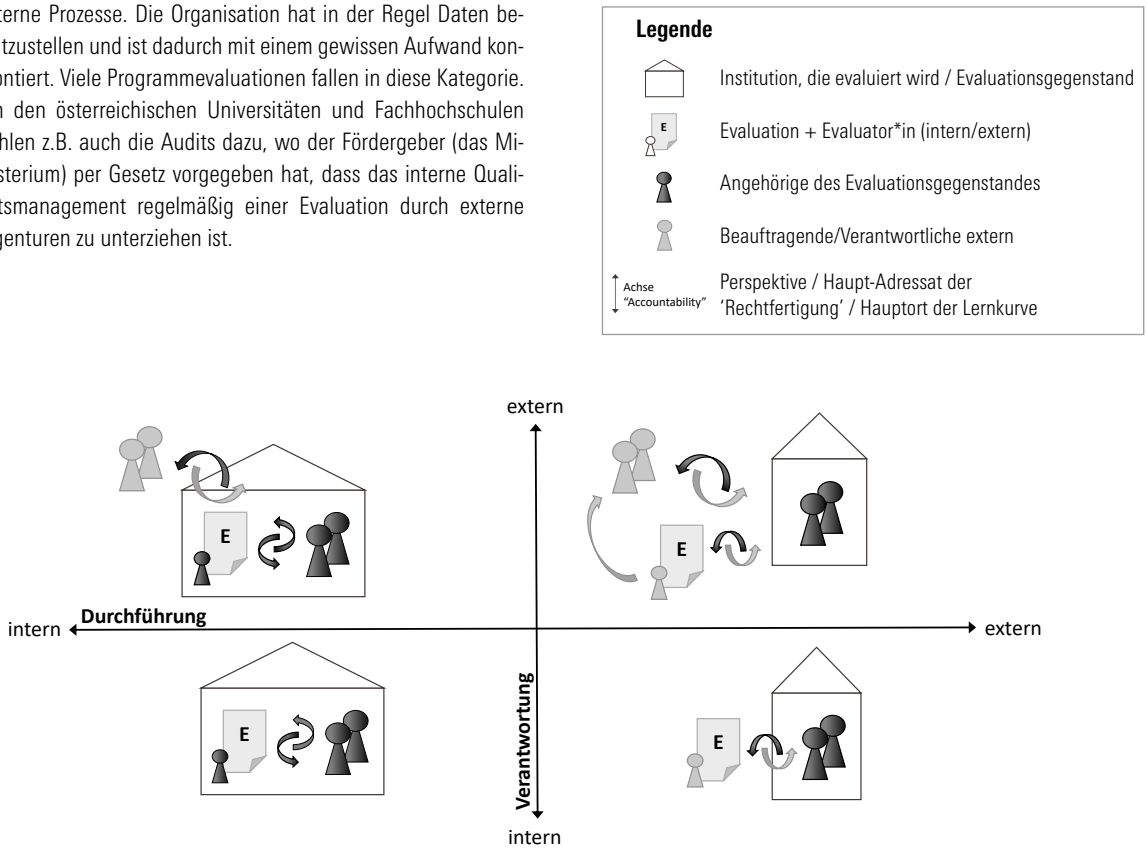

Abbildung 1: Matrix interner Evaluierungs-Zugänge nach Durchführung (intern/extern) und Verantwortung (intern/extern) - am Beispiel einer Institution als Evaluationsobjekt

In unserer Betrachtung wird nun anhand von unterschiedlichen Beispielen beschrieben, wie sich die Verortung einer Evaluierung entlang der beiden Achsen jeweils auf Ergebnisse und Empfehlungen bzw. deren Umsetzung auswirken kann.

AUSWAHL DER BEISPIELE

Die Auswahl der Beispiele für die fteval Tagung hatte den Anspruch einer großen Diversität der Zugänge zu interner Evaluierung im Sinne der beschriebenen Achsen. So stellte Meike Olbrecht, Leiterin des Referats für Evaluation und Statistik an der Alexander von Humboldt-Stiftung, deren Modell vor, in der die Beauftragung zwar extern verortet ist, Verantwortung und Durchführung aber intern in Form einer in-house Evaluierung durch die Stabsstelle Evaluation & Statistik stattfindet. Im Beispiel des Instituts für Höhere Studien stellte Thomas König eine rezente interne Evaluierung mit Hilfe eines externen Expert*innen-Gremiums vor, die zwar aus sich selbst heraus beauftragt war, aber gleichzeitig zur externen Darstellung, wie auch als Grundlage zur institutionellen Weiterentwicklung diente. Im Fall der Ludwig Boltzmann Gesellschaft beschrieb Patrick Lehner (Open Innovation in Science Center - OIS), wie sowohl die Beauftragung als auch die Durchführung in seiner Organisation derzeit internen Logiken folgt, wobei sich das im Zuge anstehender Umgestaltungen ändern könnte.

Weitere Beispiele aus der Praxis des universitären Hochschulsektors werden eingebracht um unsere Überlegungen eingänglicher zu machen und breiter zu verorten. Konkret wurden die Technische Universität Graz (TU Graz) und die Universität für angewandte Kunst Wien (die Angewandte) als Fälle beschrieben.

EVALUIERUNG, BERATUNG, REFLEXION – EINE ABGRENZUNG

Der Begriff „Evaluierung" wird in unterschiedlichen Kontexten sehr breit und beinahe großzügig verwendet. So steht die strategische Orientierung als „systematische Untersuchung der Güte oder des Nutzens eines Evaluierungsgegenstandes" (ZIT DeGEval Standards, siehe fteval Standards, Kohlweg, 2019) im Sinne der Ermöglichung von Lern- und Verbesserungsschleifen der Wahrnehmung verkürzter Kontrolle durch Dritte gegenüber. Eine klare Abgrenzung zu anderen Formaten von Reflexionsprozessen wird kaum unternommen und stellt sich bei Betrachtung der einzelnen Verfahrenstypen auch oft als schwierig heraus. Gerade bei internen Evaluierungen lohnt es sich, sich vorab stärker mit der Zielsetzung auseinanderzusetzen.

Prozessorientierte Methoden, die gruppales und organisationales Lernen durch Feedback und Reflexion unterstützen, gehen davon aus, dass es schwierig ist, sich mit eigenen Schwächen auseinanderzusetzen und dass es hierfür einen möglichst sicheren Rahmen braucht, der es den Teilnehmenden erlaubt, sich zu öffnen und neue Fragen und Perspektiven zuzulassen. Die Bewertung wird hintenangestellt, es geht weniger um quantitative Erfolgsindikatoren als um Entwicklungspotenziale. Evaluierung als Verbindung von „evidence and judgement" vertritt demgegenüber einen objektivierten Standpunkt. Bei internen Evaluierungen kann nun der „Raum", in dem beobachtet und bewertet wird, mit dem Raum zusammenfallen, der mit der Bewertung zurechtkommen soll. Dies kann sich schwierig gestalten, wenn Fragen von Macht, Zugehörigkeit aber auch persönlicher Nähe ins Spiel kommen. So macht es einen großen Unterschied, ob im Rahmen einer internen Evaluierung zu erwarten ist, dass ein negatives Ergebnis direkte Konsequenzen auf zukünftige Arbeitsbereiche oder finanzielle Ressourcen hat – sollte diese Sorge bestehen, dann kehren sich die Vorteile der Vertrautheit und Offenheit möglicherweise ins Gegenteil um, und es wird im Vergleich zu externen Evaluierungen schwieriger, transparent und objektiv zu argumentieren. Je stärker materielle Konsequenzen oder eine Einflussnahme durch Dritte zu erwarten sind, desto stärker sind die Anreize, die Selbstevaluation in die für sich gewünschte Richtung zu bewegen. Wenn hingegen keine Gefahr der Einflussnahmen von Außen besteht, dann ist interne Evaluierung – als eine evidenz-basierte Auswertung – ein geeignetes Instrument interner Reflexion.

An dieser Stelle sei noch angemerkt, dass die drei Prozesse externe Evaluierung, Selbstevaluierung und Reflexion häufig in Kombination stattfinden. So kann beispielsweise eine extern angelegte Evaluierung einer Institution einen Selbstevaluierungsbericht dieser Institution als eine der Informationsquellen beinhalten. Dieser Bericht ist häufig um eine positive Darstellung bemüht – löst aber gleichzeitig im Zuge der Erstellung Reflexionsprozesse in der Organisation aus.

Die fteval Standards nennen 12 Grundprinzipien für FTI-Evaluierungen (fteval, 2019). Wir halten die Betrachtung dieser Standards für hilfreich, um in Abgrenzung zu anderen Prozessen wie Reflexion, Monitoring, Steuerung und Organisationsentwicklung zu überlegen, was einen internen Bewertungsprozess zu einer "Evaluierung" macht. Zwei der Prinzipien sollen hervorgehoben werden:

- **"Unparteilichkeit"** setzt voraus, dass "der gesamte Evaluierungsprozess und die Ergebnisse auf unvoreingenommene Handlungen und Positionen schließen lassen und nachvollziehbar und transparent zustande gekommen sind" (S. 16). Sobald in Organisationen Hierarchien, Verbindlichkeiten, Näheverhältnisse und Abhängigkeiten existieren, ist auf diese Unparteilichkeit – die auch bei externen Evaluierungen zu sichern ist – besonders zu achten.

  Um diese Unparteilichkeit zu gewährleisten, hat es sich an den Universitäten in den letzten Jahren etabliert, Stabstellen oder Referate für Evaluierung einzurichten, die direkt unter den Rektoraten angeordnet sind, somit keinen Fachrichtungen zugeordnet sind und möglichst eigenständig agieren. Durch Abgrenzung zum Rektorat wird gleichzeitig auch die Akzeptanz der Maßnahmen erhöht, da sie dadurch weniger als „vom direkten Vorgesetzten verordnet" wahrgenommen werden. Bei der Alexander von Humboldt-Stiftung (AvH) sind vier Akteure in interne Evaluierungen involviert: Die Stabsstelle für Evaluation und Statistik (E&S) wurde vor 15 Jahren eingerichtet und ist – neben der Betreuung externer Evaluierungen – in Zusammenarbeit mit stiftungsinternen Projektteams für die Erstellung interner Evaluierungen zuständig. Der AvH steht weiter ein externer wissenschaftlicher Beirat zur Seite; schließlich entscheiden die geldgebenden Bundesministerien und der Stiftungsrat über den Evaluierungszeitplan. E&S Mitarbeiter*innen haben keine Programmverantwortung und sehen ihre Aufgabe auch bei internen Evaluierungen in kollegialer Beratung und der Förderung des Austauschs. Die Unparteilichkeit der Stabsstelle setzt voraus, dass organisational ausreichend Distanz besteht, dass die Evaluationsaufgaben und -ziele eindeutig definiert sind und dass die Rollen aller Beteiligten zu Beginn geklärt werden. Transparenz und Vertrauen sind eine Grundlage für die Nutzung als auch den Nutzen der internen Evaluierung. Die Diskussion der Ergebnisse, Schlussfolgerungen und Empfehlungen mit „Dritten", hier dem Beirat für Programmevaluationen, erhöht die Objektivität und stärkt letztendlich die Rolle der Stabsstelle. Im Beispiel des IHS wurde ein externes Sekretariat zur Abwicklung der sowohl intern als auch mit externen Evaluierenden durchgeführten Studie eingerichtet. Die Interpretation der Ergebnisse erfolgte allerdings intern. Am OIS Center der LBG versucht man in ihrer aktuellen Ausgestaltung die Wirksamkeit der eigenen Aktivitäten hinsichtlich der Ziele des Centers laufend zu überprüfen. Hierzu wurde ein Zugang basierend auf einer umfassenden „Theory of Change" gewählt, der auch Experimentierraum zulässt. Inwiefern dieser Zugang allerdings auch Überparteilichkeit garantieren kann, bleibt dabei unklar, trotz deutlicher Bemühungen zur Transparenz.[3]
- Das Prinzip **"Unabhängigkeit"** wird in den Standards wie folgt definiert: "Eine Evaluierung wird mithilfe von wissenschaftlichen Methoden erstellt und unterschiedliche Meinungen bzw. Positionen sind berücksichtigt. Die Evaluierung ist weder von Politik, Auftraggeber*innen, dem Programmmanagement, den Betroffenen oder auch von einem möglichen Bias der Evaluator*innen selbst, inhaltlich beeinflusst bzw. manipuliert. (...)" (S. 16).

  Aus diesem Grund wird externen Evaluationsprozessen häufig eine höhere Wertigkeit zugeschrieben. Zum einen wird durch die Beauftragung einer externen Agentur die Unparteilichkeit sowohl in Richtung Auftraggeber*in als auch der zu evaluierenden Einheit gewährleistet. Dies wird nochmals durch die Auswahl der Peers unterstützt. So wird z.B. bei Evaluierungen von Fakultäten an der TU Graz oder der Angewandten die Durchführung durch eine externe Agentur ganz stark mit den Begriffen der Unabhängigkeit und der Transparenz verknüpft (Gaberscik & Berner, 2019 und Kernegger, 2019). Im Fall von Selbstevaluierungen ist die Lage anders: Hier kann man mittels der Auswahl einer geeigneten Methode ausreichend Objektivität sicherstellen. Die Herausforderung liegt vermutlich darin, die geeigneten Methoden und Akteure zu wählen, die in die Evaluierung eingebunden werden. Es kann bei einer Selbstevaluierung jedoch

3 OIS Impact Model https://ois.lbg.ac.at/en/projects/impact#tools

nicht von einem "Gutachten" die Rede sein, hier befindet man sich ganz klar im Bereich der Selbstreflexion. An den Beispielen der Evaluation des IHS und der Praxis der AvH sieht man den Versuch, durch externe Elemente sowie der Art ihrer Einbettung diese Unabhängigkeit zu erzeugen. So wirken an der AvH sowohl eine Stabstelle für Evaluierung, ein externer Beirat, als auch interne Projektteams und der Stiftungsrat als Akteur*innen gemeinsamer interner Evaluationsvorhaben. Das IHS zog wie erwähnt interne wie externe Expertise zu Rate, überließ die Abwicklung dabei aber klar einem externen Sekretariat. Die LBG möchte bei der regelmäßigen und systematischen Evaluierung ihrer Ludwig-Boltzmann Institute (LBIs) die Unabhängigkeit der Vorgangsweise nicht nur durch das Zuziehen externer, sondern sogar ausschließlich internationaler Expert*innen sicherstellen.

BEAUFTRAGUNG UND EVALUATIONSOBJEKT

Die Beauftragung spielt bei Evaluierungen eine wesentliche Rolle: Im Bereich der FTI-Politik geht es um die Verwendung öffentlicher Gelder. Der Bedarf an Evaluierung kann sich entweder aus rechtlichen Bestimmungen ergeben, oder aus einem reinen Informationsbedürfnis. Zur Beauftragung einer Evaluierung gehören mehrere Schritte: Die Definition des Evaluationsgegenstandes, die Definition von Evaluierungsfragen, gegebenenfalls die Auswahl von Expert*innen zur Durchführung, ein gewisses Maß an Qualitätskontrolle, der offizielle Abschluss des Evaluierungsprojekts durch die Abnahme eines Endberichts, gegebenenfalls die Freigabe zur Veröffentlichung, jedenfalls die Kommunikation der Ergebnisse an relevante Zielgruppen, in der Folge gegebenenfalls auch die Verantwortung für die Umsetzung von Empfehlungen, bzw. die Beaufsichtigung derselben. Für eine Evaluierung ist es erfahrungsgemäß gut, wenn es ein starkes "Ownership" bei gleichzeitig gesicherter Unabhängigkeit der Evaluierung gibt. Dieses Ownership liegt entweder in der externen Governance (Politik, Programmeigentümer, Aufsichtsorgan), in der internen Leitung (Geschäftsführung, sonstige Leitungsorgane), in einer Stabstelle oder Abteilung für Evaluierung, Monitoring oder Qualitätssicherung oder aber bei den Verantwortlichen für den Evaluierungsgegenstand selbst. Wir halten es in jedem dieser Fälle für unabdingbar, dass zu Beginn des Evaluierungsvorhabens geklärt wird, wer "Eigentümer*in" der Ergebnisse ist, und wer über diese Ergebnisse jedenfalls informiert wird, da dies die Verbindlichkeit des Evaluierungsvorhabens erhöht.

Auch hier kann sich die Einbindung externer Agenturen als vorteilhaft herausstellen. Die Erfahrung hat gezeigt, dass Auftraggeber*innen zwar das Ziel einer Evaluierung nennen können, sich aber über Verantwortlichkeiten und die Wichtigkeit von klaren Definitionen meist nicht bewusst sind (Froschauer-Neuhauser et al., 2020).

Dies ist bei begleitenden Evaluierungen eine besondere Herausforderung, da hier häufig die Programmverantwortlichen Auftraggeber*innen sind, aber angesichts der Unsicherheit, in welche Richtung die Zwischenergebnisse der Evaluierung ausschlagen, nicht festgelegt wird, mit wem die Ergebnisse geteilt werden. Möglicherweise wollen sich Auftraggeber*innen vorbehalten, ohne zu viel Öffentlichkeit an diesen Ergebnissen zu lernen. Wenn jedoch im Prozess eine Triangulation fehlt, hat dies einen Einfluss auf die Fortsetzung des Evaluierungsprozesses, der dann möglicherweise in Richtung Prozessberatung und -begleitung tendiert. Dies mag dem Bedarf entsprechen und durchaus nützlich sein, es haben sich jedoch im Feld von Coaching und Prozessbegleitung teilweise andere Qualitätsstandards etabliert als bei der Evaluierung.

Meike Olbrecht von der AvH illustrierte am Beispiel der Evaluierung eines großen Stipendienprogramms der Stiftung die unterschiedlichen Ausrichtungen der externen und der internen Evaluierung: Jedes Programm der AvH wird alle 10 Jahre durch externe Dienstleistende hinsichtlich der Erreichung der Programmziele evaluiert. Die Berichte werden im wissenschaftlichen Beirat und dem Stiftungsrat diskutiert und dann auf der Internetseite der Stiftung – gegebenenfalls mit einer Stellungnahme zu den Empfehlungen – veröffentlicht. Fünf Jahre nach der externen Evaluierung führt das Referat „E&S" eine interne Evaluierung der Umsetzung der Empfehlungen durch und erstellt auf dieser Basis einen Zwischenbericht. Zusätzlich informiert dieser Bericht über statistische Trends und aktuelle Kennziffern der Programmentwicklung. Auch dieser wird im wissenschaftlichen Beirat und in der Regel im Stiftungsrat diskutiert, und dann an die Geldgebenden gesendet, nicht jedoch veröffentlicht. Die Ergebnisse dienen zum einen internen Anpassungen, zum anderen der Vorbereitung der nächsten Programmevaluation.

DIE KONKRETE UMSETZUNG (INTERN/EXTERN)

Neben der Definition der Eckpunkte der Verantwortung über die Ergebnisse braucht es für die konkrete Umsetzung einer Evaluation eine genaue Definition darüber, was es herauszufinden gilt. Der Evaluationsinhalt und die benötigten Kompetenzen für die Evaluierung müssen festgestellt werden. Aufgrund dieser Definitionen kann man sich im Anschluss für eine passende Form der Umsetzung (extern/intern/Mischform) entscheiden.

Im Hochschulsektor haben Evaluierungen in den letzten Jahren stark zugenommen, nicht zuletzt dadurch, dass sie von Seiten des Ministeriums für Bildung, Wissenschaft und Forschung zu verschiedenen Themen im Rahmen der Leistungsvereinbarungen eingefordert werden. Viele Universitäten versuchen die Rechenschaftslegung aber auch möglichst effektiv mit der Möglichkeit zur internen Weiterentwicklung zu verknüpfen. Der Trend geht dahin, Evaluierungen intern anzustoßen und so zu gestalten, dass man sie auch für die Darstellung und die Rechtfertigung nach Außen verwenden kann. Damit einhergehend ist eine stärkere Systematisierung und Formalisierung der Evaluierungen – die Stabstellen für Qualitätssicherung und Evaluierungen haben Konzepte zu regelmäßigen Evaluierungen von Einheiten entwickelt, die zudem auch transparent an alle Universitätsangehörigen kommuniziert sind.

Die TU Graz sieht beispielsweise eine Evaluierung ihrer Fakultäten in einem 7-Jahreszyklus vor. Das bedeutet, dass jedes Jahr eine der Fakultäten evaluiert wird. Hierbei ist der Prozess von der Ausschreibung bis hin zu den vordefinierten Kernthemen formalisiert. Gleichzeitig erhält man sich die Flexibilität auf aktuelle Themen von außen reagieren zu können – nachdem das Ministerium in den Leistungsvereinbarungen mit den Universitäten eine starke Zielsetzung auf „Studierbarkeit" definiert hat, wird dieses Thema auch stärker in den laufenden Evaluationen mitaufgenommen. Individualität findet in der jeweiligen Ausgestaltung Platz – so sind unterschiedliche Fokus-Setzungen möglich oder es wird auch ein Mitspracherecht bei der Peer-Auswahl eingeräumt.

Kommen wir noch einmal auf die AvH zurück: Die Schnittstelle zu externen Evaluator*innen ist zum einen eine öffentliche Ausschreibung mit Pflichtenheft in einem zweistufigen Verfahren (schriftliches Angebot, Vortrag und Diskussion des Angebots mit dem Evaluierungsbeirat), gefolgt von der unabhängigen Evaluierung entlang der formulierten Evaluierungsfragen durch externe Expert*innen und die Abnahme des Endberichts durch die Geschäftsführung der AvH auf Empfehlung des Beirats. Die interne Evaluierung orientiert sich an den Empfehlungen, dokumentiert die Initiativen der Umsetzung und betrachtet dann mittels ergänzender Untersuchungen den Erfolg dieser Umsetzung. So wurde beispielsweise die Empfehlung aus einer externen Programmevaluation zum Humboldt Forschungsstipendien-Programm aus dem Jahr 2011, unterrepräsentierte Länder im Stipendienprogramm stärker einzubinden, in zwei Schritten umgesetzt: Aufbauend auf einer internen Potenzialanalyse wählte die AvH fünf Schwerpunktländer und führte in den Jahren 2012-2018 eine Schwerpunktländerinitiative durch, indem sie Maßnahmen zur Erhöhung der Anzahl von Bewerbungen und Bewilligungen in diesen Ländern durchführte, wodurch. diese in allen Ländern gesteigert werden konnten. Solche Ergebnisse, aber auch weniger erfolgreiche Umsetzungsversuche, werden im Zwischenbericht dokumentiert.

WIE WIRD NUN VERBINDLICHKEIT ERZEUGT? DIE ANWENDUNG DER ERGEBNISSE UND DER NUTZEN INTERNER EVALUIERUNG

Jede Evaluierung, egal ob extern, intern oder in einer Mischform, hat einen Effekt auf das Evaluationsobjekt. Auch in Fällen, in denen die Accountability gegenüber unterschiedlichen Stakeholdern im Zentrum steht, ergibt sich durch die Reflexion des eigenen Tuns bzw. durch die vertiefte Auseinandersetzung mit den eigenen Key Performance Indicators (KPIs) auch immer ein Effekt nach innen. Je stärker es Richtung „intern" geht, desto stärker legt sich die Gewichtung auf die Weiterentwicklung des Evaluationsobjekts.

Die Umsetzung von Schlussfolgerungen und Empfehlungen einer Evaluierung kann sowohl davon abhängen, wie viel Druck erzeugt werden kann, als auch, wieviel Verständnis für das Verbesserungspotenzial erzeugt wird. So gibt es einige Förderprogramme, bei denen Evaluierungspanels die Möglichkeit haben, die Förderung an die Umsetzung bestimmter Auflagen zu knüpfen. Dies erzeugt eine hohe Verbindlichkeit. Häufig ist es aber auch ein Anliegen, dass die dargestellten Ergebnisse ausreichend überzeugend und nachvollziehbar sind, damit Entscheidungsträger*innen die Empfehlungen aufgreifen. Interessanterweise hat in einer dynamischen, an der (Organsations-)Entwicklung ausgerichteten Sichtweise die sogenannte "Gutachter*innenberatung" keine gute Nachrede: "Bis in die Siebzigerjahre des vorigen Jahrhunderts war sie die vorherrschende Form der Unternehmensberatung, bei der externe oder interne Expertinnen und Experten bzw. Stabsleute eine Organisation untersuchten und den Auftraggebenden ihren Analysebefund mit Vorschlägen für Verbesserungen vorlegten. Die Beratung war mit dem "Gutachten" für empfohlene Veränderungen bereits erledigt, denn die Umsetzung wurde als selbstverständliche Sache des Managements gesehen. Und genau dort begannen für die Organisationen die eigentlichen Probleme." (Glasl et al, 2005: S. 34).

Es lässt sich beobachten, dass sich auch in der Evaluierungs-Community in den vergangenen Jahren etwas in der Herangehensweise verändert hat: Durch die Anerkennung unterschiedlicher partizipativer und gruppaler Erhebungs- und Analysemethoden neben der Analyse von Daten und Fakten sind auch Prozesse in den Fokus von Evaluierungen gerückt. So erweisen sich Besprechungen von Zwischenergebnissen, bei denen unterschiedliche Stakeholder eingeladen sind, sich mit den Beobachtungen und Auswertungen auseinanderzusetzen, als förderlich für eine Umsetzung späterer Empfehlungen. Es wächst also die Bereitschaft, prozessorientierte Vorgangsweisen (wie machen wir das?) mit möglichst objektiven Erfolgsindikatoren (wie viel ist gelungen?) zu kombinieren. Letztendlich gilt auch für interne Evaluierungen, dass sie sich an Nachvollziehbarkeit und Transparenz ausrichtet, um relevante Schlussfolgerungen und deren Umsetzung zu unterstützen. Das Beispiel der AvH zeigt, dass durch die Kombination eines sehr regelmäßigen Evaluierungsplans für alle Programme, ein gut ausgestattetes internes Referat für Evaluation und Statistik, sowie die Rückkopplung mit einem wissenschaftlichen Evaluationsbeirat ein hohes Maß an Verbindlichkeit erzeugt werden kann.

An der TU Graz wird die Verbindlichkeit der Evaluierungen insofern hergestellt, als dass die Fakultät nach Abschluss der Evaluierung gefordert ist, anhand der Empfehlungen zur Weiterentwicklung aus dem Peer-Bericht Arbeitsschritte abzuleiten, die auch mit konkreten Zeitplänen hinterlegt sind. Dieser Schritt erfolgt gesondert von der extern beauftragten Evaluierung nur noch universitätsintern. Sie stellen in der Folge auch die Grundlage für die jährlichen Folgegespräche zwischen Rektorat und Fakultätsleitung dar.

Die LBG verknüpft die Evaluierung der Ludwig Boltzmann-Institute mit der sehr konkreten Entscheidung, ob ein Institut weitergeführt werden soll oder nicht, was die Verbindlichkeit klar definiert. Im Fall der internen Reflexion im OIS Center ist die Verbindlichkeit nicht deutlich zu erfahren. Im Beispiel der IHS-Evaluierung war die Verbindlichkeit im deutlichen Wunsch zur Neuaufstellung und der Argumentation gegenüber dem Auftraggebenden verankert, somit wurden den Empfehlungen entsprechend die Zahl der Forschungsgruppen reduziert.

STIMMEN AUS DER FTEVAL COMMUNITY

Ausgangspunkt dieses Artikels war die fteval Tagung zu interner Evaluierung, bei der wir die Diskussionen der Teilnehmenden eingefangen haben. Diese möchten wir hier kurz darstellen.

Die rund 60 Akteur*innen, waren mehrheitlich selbst bereits Teil eines (internen) Evaluierungs-Vorhabens. Bei der Bewertung, wie stark oder wenig die Ergebnisse ernst genommen und umgesetzt wurden, fielen die meisten Antworten der Teilnehmenden im Mittelfeld aus.

In der mit „Mentimenter" durchgeführten Umfrage waren die Teilnehmenden mehrheitlich der Überzeugung, dass in ihrer Institution derzeit eine interne Evaluierung mit Hilfe von externen Expert*innen am meisten Nutzen bringen würde. Eine rein interne oder rein extern durchgeführte Evaluierung wurde aktuell für die Heimatinstitution weniger nützlich eingeschätzt. Das deckt sich mit der allgemeinen Beobachtung,

dass diese Mischform auch die am häufigsten in der Praxis angewendete Variante ist.

Die Teilnehmenden wurden auch befragt, welche Dynamiken während interner Evaluierungen zu beobachten sind. Die Antworten sind in der folgenden Tabelle thematisch gruppiert dargestellt:

Welche Dynamiken sind bei internen Evaluierungen zu beobachten?	
Aspekt	**Genannte Antworten**
Vorbereitung und Ausrichtung	• Vereinbarung von Fokusthemen • Wirkung und Nutzen/Nutzung, Verhältnis von Aufwand und Ertrag • schwierige Einigung auf Prioritäten der Evaluation • Interne Evaluation von allen (intern) gewollt? • keine hohe Priorisierung (Zeit und Ressourcen)
Bereitschaft	• Hohe Bereitschaft Aspekte offen zu reflektieren • Anstoß für Veränderungen, die sonst kaum/schwer in Angriff genommen worden wären; Neuer Blick auf interne Prozesse und Abläufe
Widerstände	• Widerstände; Misstrauen; Skepsis; Umgang & Überwindung von Widerständen • Unwille; Fehlender Wille, wirklich aus der Evaluation zu lernen • Ängste; Angst vor Schelte von höherer Ebene, weil gewisse Kennzahlen nicht erfüllt werden, die die diverse Realität nur unzureichend wiedergeben • Verweigerung der Management Response • wenig Kooperationsbereitschaft; Kooperationsschwierigkeiten
Konflikt-potential	• Rollenkonflikt • Schwierige Position des Akteurs; „Minenfeld"; Diskreditierung der Evaluator*innen; Anzweifeln der Methodenkompetenz durch Management; Abwertung der internen Verfahren; mangelndes Vertrauen in die Fähigkeiten der internen Evaluator*innen • Interne Konkurrenzkämpfe; Positionskämpfe im Top- und Bereichsmanagement • Unterschiedliche Sichtweisen darauf, was wichtig ist Verhandlungen verschiedener Interessenslagen; unterschiedliche Prioritäten • Zutagetreten eines unterschiedlichen Verständnisses von internen Prozessen und Verantwortlichkeiten
Probleme im Prozess	• Rechtfertigung der Personen, die das Evaluierungsobjekt umgesetzt haben • Vertrauen in die Institution; Anonymisierung schwierig Infragestellen der Unabhängigkeit; fehlende Transparenz • Mangelnde Unabhängigkeit • Stress • fehlende/mangelnde Quality Culture • Verschiebung der Prioritäten und Zielsetzungen der Evaluation während diese bereits läuft
Ergebnisse	• Misstrauen, wie Ergebnisse verwendet werden; Follow up ist wichtig • fehlende/mangelnde „Quality Culture"
Ideen, Vor-/Ratschläge	• Stärkerer Fokus auf Vorbereitung und Umsetzungsmonitoring • Weg von der Rechenschaftslegung hin zur Profilentwicklung
Kritik	• Interne Evaluierungsergebnisse als Nabelschau • „Evaluitis"

Nach einer Diskussion darüber, welche Mechanismen zu installieren sind, damit eine interne Evaluierung „garantiert scheitert", wurden die Einschätzungen der Teilnehmenden dazu gesammelt – nun als „No-Gos" formuliert. Die Antworten erstrecken sich über verschiedene Aspekte der Konzeption, Durchführung und Ergebnisbehandlung interner Evaluierung. Sie sind in der folgenden Tabelle gelistet:

„No-Gos“ interner Evaluierung	
Aspekt	**Genannte Antworten**
Konzeption	• Kein echter Auftrag & keine interne Unterstützung; Unklarer Evaluationsauftrag; Unklarheit über Ziele und Konsequenzen • Zu ambitionierte / große Evaluierungsgegenstände Ð Ziele müssen auch erreichbar sein; unrealistische Evaluationsziele • ungenügende Ressourcen • Fehlendes Evaluationskonzept; Kein Evaluationskonzept • nur Vorgaben an die zu Evaluierenden, keine Gestaltungsmöglichkeiten, kein Raum zur Selbstreflexion • Hidden Agenda; Intransparenz; Fehlende Transparenz; die Evaluation „geheim“ zu halten • Nicht alle bei den Terms of References einbinden • Überlagerung mit anderen Evaluationen
Durchführung	• Inkompetente Personen beauftragen ohne methodisches Wissen • Unklare Rollen; Überlagerung von Prozessen (Evaluationen, Audits, …) • Interne Konkurrenzkämpfe; Zweifel über Objektivität schüren; Konflikte nicht auflösen • die Beteiligten nicht einzubeziehen; Führungsgremium nicht einbinden; gewisse Stakeholder-Gruppen nicht evaluieren (z. B. befragen) • Mangelnder Umsetzungswillen • Kommunikation zwischen Beteiligten ist sehr wichtig; Schlechte Kommunikation
Ergebnisse	• Ergebnisse nicht/schlecht kommunizieren • sich nicht überlegen, was man mit Ergebnissen machen könnte; offenlassen, wie mit Empfehlungen umgegangen wird

CONCLUSIO

Die fteval Tagung „Verbindlichkeit in der internen Evaluierung“ hat ein großes Reflexionspotential und eine breite Vielfalt der Zugänge zu Evaluierung in der österreichischen Landschaft aufgezeigt. Mit Hilfe dieses Artikels haben wir anhand von Beispielen versucht, die unterschiedlichen Ausprägungen und deren Auswirkungen auf die Unabhängigkeit, das Ownership und die Verbindlichkeit in der Umsetzung zu diskutieren und sind zu folgenden zentralen Erkenntnissen gelangt:

- Interne Evaluierungen nehmen insgesamt zu, während sich die Art der Nutzung mitunter verschiebt. So sieht man beispielsweise an den Hochschulen mittlerweile stärker den Nutzen von internen Evaluationen in Hinblick auf die interne Weiterentwicklung und nicht allein als Darstellung gegenüber den Fördergebenden. Nicht ausschließlich die Rechenschaftslegung einem Beauftragenden gegenüber ist Ziel, sondern es werden interne Evaluationsansätze zur gesellschaftlichen Wirkungsmessung der eigenen Arbeit oder auch zur institutionellen Selbstreflexion der eigenen Organisationsentwicklung und somit auch der Accountability der eigenen Institutionsangehörigen gegenüber konzipiert.
- Die verschiedenen Ausprägungen von Evaluierung lassen sich nur bedingt abgrenzen, die Übergänge sind fließend. So wurden in den beobachteten Beispielen viele Mischformen von interner oder externer Durchführung gleichwohl wie interne und externe Verantwortung festgestellt. Es ist allerdings wichtig mitzubedenken, welche Auswirkungen bestimmte Arten der Evaluation auch in anderen Dimensionen haben können, wo beispielsweise Verantwortung hinsichtlich der Ergebnisverortung liegt
- Die Definition der Verantwortung ist für den Erfolg der Evaluierung und somit die Umsetzung der Empfehlungen sehr wichtig. Verbindlichkeit wurde in den Beispielen insbesondere durch eine klare räumliche und zeitliche Verankerung der Evaluierung in die Abläufe und Systeme einer Institution erreicht (festgelegte Evaluationsperioden bzw. eine eigene Einheit, ein Sekretariat oder eine Stabstelle für die Evaluationsvorhaben).
- Unabhängigkeit wird meist durch die Beiziehung zu externen Akteur*innen sichergestellt. So die Funktionen transparent definiert und abgegrenzt sind, kann auch eine organisationsinterne Stabstelle einen gewissen Grad an Unabhängigkeit repräsentieren. Klare und transparente Kommunikation zwischen allen Beteiligten ist jedenfalls förderlich.

Wir hoffen mit diesem Beitrag die regen Diskussionen der Tagung eingefangen und verankert zu haben, um Impulse für weitere interne Evaluationsvorhaben zu geben. Bei der Tagung wurde der hohe personelle Aufwand als Schwierigkeit interner Evaluierungen hervorgehoben. Eine hohe Verbindlichkeit in der anschließenden Umsetzung der Ergebnisse kann diesen Aufwand lohnend machen.

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AUTORINNEN

ISABELLA E. WAGNER
Österreichische Plattform für Forschungs- und Technologiepolitikevaluierung (fteval)
Austrian Platform for Research and Technology Policy Evaluation
Linke Wienzeile 246, 1150 Wien
E: wagner@fteval.at
ORCID: 0000-0002-2772-6771

ELISABETH FROSCHAUER-NEUHAUSER
AQ Austria - Agentur für Qualitätssicherung und Akkreditierung Austria Bereich Audit & Beratung
Franz-Klein-Gasse 5, 1190 Wien
E: Elisabeth.Froschauer-Neuhauser@aq.ac.at
ORCID: 0000-0002-4586-8706

KATHARINA WARTA
technopolis group | austria
Rudolfsplatz 12/111010 Wien
E: warta@technopolis-group.com
ORCID: 0000-0002-5937-0044

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internal evaluation, commitment, accountability, assignment, execution, objectivity

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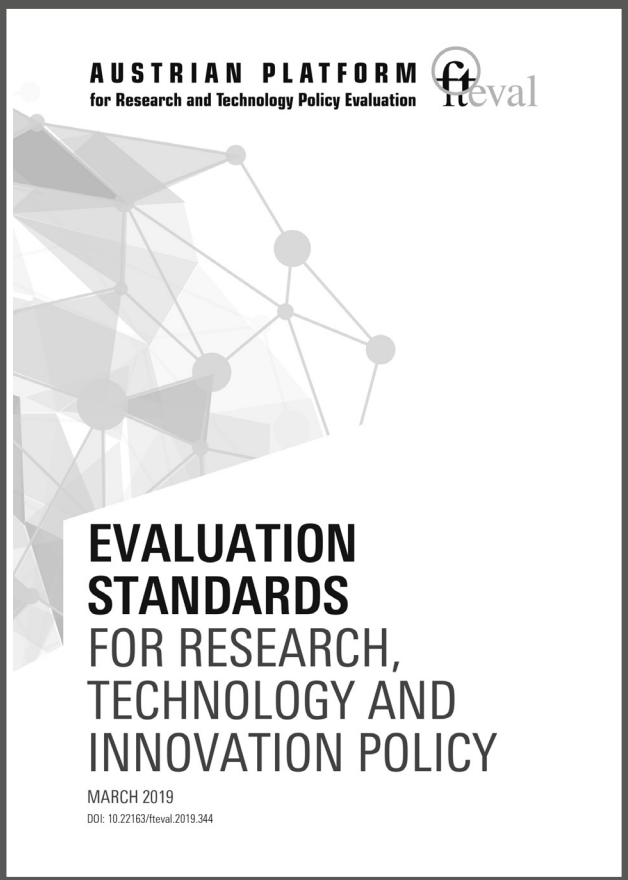

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