Vienna Science and Technology Fund wwtf.at

WWTF IMPACT EVALUATION 2025

ACCOMPANYING RESEARCH

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W|W|T|F

CWTS Meaningful metrics

AIT AUSTRIAN INSTITUTE OF TECHNOLOGY

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Table of Content

1 EXECUTIVE SUMMARY

This executive summary presents the key findings from a mixed-methods study providing empirical evidence for the impact evaluation 2024/2025 of the Vienna Science and Technology Fund (WWTF) by an international evaluation panel. By integrating bibliometric analysis, results of a survey conducted among funding beneficiaries, insights from interviews and a focus group with different experts from the Vienna research area, the study highlights the contributions of WWTF's activities and funding instruments to its strategic objectives, specifically (i) funding of excellent projects and research, and (ii) strengthening the Vienna research area from 2014 to 2024. The study provides evidence for five evaluation topics:

I. Quality of Scientific Output of WWTF-Funded Projects

Our research shows that WWTF plays a pivotal role in advancing scientific excellence in Vienna by focusing on high-quality basic research. Survey data supports this perception, with 99% of respondents agreeing that **WWTF contributes to scientific excellence**. This approach results in exceptional scientific output, with bibliometric data revealing that WWTF-funded projects have an impact 80% above the world average, particularly in high-impact publications.

This commitment to scientific excellence is also deeply embedded in the local context, with WWTF recognized in the Vienna research community for funding **projects that are not only scientifically rigorous but also socially relevant**. Moreover, WWTF is acknowledged for its innovative funding formats and strategic thematic programming.

WWTF's ability to support high-quality research is bolstered by its rigorous application process, which ensures only the best projects receive funding. Once awarded, researchers benefit from **optimal conditions for the production of high-quality research,** from long-term financial support, flexibility, and a strong sense of trust from the organization.

WWTF's impact **extends beyond research to career development**. Survey data shows that 62% of respondents noted career support, with 84% of VRG grantees advancing to higher academic positions, including 6.3% progressing to Full Professor roles so far. Results from the bibliometric analysis highlight the strong focus of WWTF in funding significantly younger researchers in comparison with other active funding agencies (like ERC, FWF or the Viennese average).

II. Contribution of WWTF to the Vienna Research Area - Emerging Fields

Strengthening the Vienna research area is recognized as a primary goal of the WWTF. WWTF's approach focuses on addressing and strategically supporting gaps identified through continuous dialogue with the scientific community through targeted funding and initiatives.

WWTF's success stems among other things from its role as a **strategic partner for academic institutions and policy actors**. Valued by Vienna's universities for its flexible funding and understanding of institutional needs, WWTF fosters strong relationships through regular engagement with university leadership. As a key link between academia and the City of Vienna, WWTF bridges research, policy, and society. WWTF's role extends beyond financial support; its active involvement in media and science communication also contributes **significantly to increasing the visibility of research within the Vienna research area**.

Bibliometric analyses highlight WWTF's strong influence on the evolution of the Vienna research area, particularly **in emerging research fields**. Areas such as cognitive sciences, biomedical research, and interdisciplinary domains like epidemiological modeling, knowledge graphs, and the gut microbiome show growth rates significantly above expectations. This demonstrates WWTF's role in catalyzing innovative research directions within the region.

III. Contribution of WWTF to collaborations and interdisciplinarity

Survey and interview data confirm WWTF's unique role in embedding interdisciplinarity through inclusive peer review, tailored funding calls, and cross-disciplinary partnerships. Its impact is evident in areas like precision medicine, where it fosters collaboration between clinicians, researchers, and computational scientists. University representatives note that **WWTF projects show higher interdisciplinarity compared to other funding sources**.

Bibliometric analysis reveals WWTF's strong emphasis on international and interdisciplinary collaboration, with internationally co-authored publications showing twice the global average impact. **WWTF-funded projects also exhibit high knowledge base diversity**, notably in cognitive sciences, biomedical research, and computer sciences. Research areas or topics like epidemiological modeling, aesthetic curiosity, and the evolution of cooperation demonstrate diversity levels 50% above the world average, reflecting strong interdisciplinarity.

Quantitative and qualitative findings highlight WWTF's contribution to interdisciplinary knowledge creation, with 98% of beneficiaries acknowledging its role in integrating diverse perspectives and 99% emphasizing success in building on varied knowledge bases. High levels of co-creation, data sharing, and methodological collaboration further strengthen these efforts. Structural barriers persist, including restrictive university policies, limited federal support for interdisciplinary projects, publication challenges, and access constraints to academic resources.

Beyond research, **WWTF acts as a bridge-builder**, expanding academic networks across Vienna. While sustaining collaborations varies, WWTF supports partnerships with policymakers, NGOs, and industry—though engagement beyond academia remains an area for growth.

IV. Impact stories of WWTF

Across all *Stories of Impact*, described by WWTF in its Self-Assessment report (SAR), WWTF's contributions are multifaceted. The fund actively engages key stakeholders from diverse sectors—research, policy, and industry—to **initiate impactful collaborations** for the stories of impact. This strategic networking connects actors who might not otherwise intersect, enabling initiatives like the Smart City Strategy, Digital Humanism, Precision Medicine, and Data Advocacy to thrive. Through **targeted agenda-setting** activities and a strong media presence, WWTF influences public discourse and policy directions, particularly in areas like Data Advocacy and Digital Humanism. Additionally, WWTF **provides generous, strategically directed funding** that for example supports projects of higher risk or is opening essential resources for advancing these impactful stories, like in VRG program and Precision Medicine. Its agile and **flexible funding model often pioneers new approaches**, paving the way for larger-scale funding and institutional support in subsequent phases, like in Data Advocacy. With a **keen understanding of its role within Vienna's research ecosystem**, WWTF maximizes its impact.

V. EU Mission orientation in the research of WWTF

WWTF-funded research aligns with key EU Missions, particularly in health, digitalization, environmental sustainability, and urban development. Programs like Environmental Systems Research and Life Sciences projects contribute significantly to EU mission-oriented goals, with a high level of specialization in urban governance, circular economy, and water systems research.

Medical research funded by WWTF shows strong alignment with the Cancer Mission, demonstrating high scientific impact and specialization in screening, early detection, and cancer understanding. Interdisciplinary initiatives in Digital Humanism and ICT further reflect WWTF's contribution to cross-cutting EU Mission priorities.

2 INTRODUCTION

This report, prepared by AIT Austrian Institute of Technology in close collaboration with the Centre for Science and Technology Studies (CWTS) at Leiden University, aimed to provide an international evaluation panel for the evaluation of the Vienna Science and Technology Fund (WWTF) 2024/2025 with evidence on how WWTF's activities and instruments contribute to achieving the overall strategic objectives, specifically (i) funding of excellent projects and research, (ii) strengthening Vienna as a city of science and innovation through the emergence of new fields and approaches, (iii) contributing to the thematic and structural dynamics of the Vienna research area through bridging disciplines and facilitating interdisciplinarity, (iv) and being socially relevant.

WWTF is a non-profit research funding organization that has been funding scientific research since 2002. The fund employs several funding instruments, including larger research projects (up to €1 million per project) and research groups for early-career-researchers, known as 'Vienna Research Groups' (up to €1.6 million per grant, recently raised to €1.8 million). In addition, WWTF offers an infrastructure program for universities and occasionally applies a supplementary funding instrument for smaller activities, known as 'Supplementary Measures.' What is characteristic of WWTF is that its funding activities are carried out within thematic priorities (for more detailed information see the Self-Assessment-Report (SAR) by WWTF). The aim of this study is not to describe the structure of WWTF's funding mechanisms or programs, as these are detailed in the SAR provided by WWTF.

This study examines the past achievements of WWTF from 2014 to 2024 in relation to its mission and specific funding approach. The mission and strategic objectives of WWTF, as well as its distinctive funding approach, serve as the framework through which the achievements of the past decade are analyzed.

Specifically, this study provides evidence on the following four aspects:

(i) The quality of the scientific output of WWTF funded projects,
(ii) The contribution of WWTF to the Vienna research area in terms of the emergence of new fields and approaches,
(iii) The contributions of WWTF to bridging disciplines and to facilitate interdisciplinarity,
(iv) The impacts and contributions of WWTF in selected areas of activities (stories of impact). These dimensions are complemented by
(v) Considerations of WWTF's relevance within the broader context of EU Missions, providing additional insights to address the question of how research funded by WWTF contributes to societal challenges.

The study provides this evidence by

- measurement of key indicators and tracking of developments of the scientific output using bibliometrics,
- the quantification of experiences and opinions of funding beneficiaries via results of a survey,
- and in-depth exploration of external perspectives from the Vienna research area through interviews and a focus group.

By combining these methods, the report aims to substantiate the international panel's evaluation with integrated, multi-method empirical results to provide a solid foundation for validated and reliable conclusions.

3 METHODOLOGY AND METHODS

3.1 Mixed methods design as overall approach

The study deliberately adopted a mixed methods approach, combining bibliometric analysis, a survey, an online focus group, and several interviews to generate more comprehensive and meaningful insights than could be obtained from qualitative or quantitative methods alone. The integration of both qualitative and quantitative components was intentional, ensuring that the findings from each method were not treated separately but rather interconnected throughout the research process. All evaluation questions (except those related to EU Missions) are addressed using the results of all methods and their synthesis. The integration of methods was applied during data collection and analysis, ensuring mutual informing and providing insights for the development of instruments. Synthesis was conducted at the results level, which allowed for a more holistic and nuanced understanding, with each methodological strand contributing to coherent conclusions (Tashakkori & Creswell, 2007).

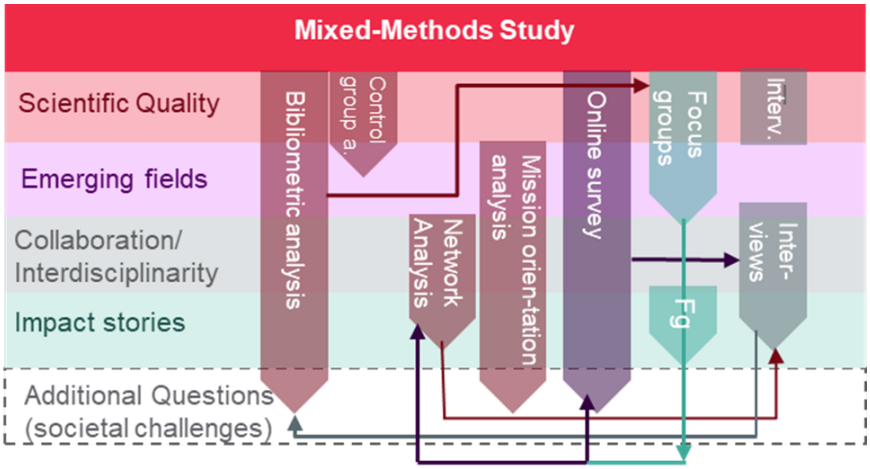
The mixed methods approach brought several advantages to the study. Triangulation, or increased validity, was achieved by combining qualitative and quantitative research to cross-check findings, which enhanced the overall reliability of the results. This approach also allowed the strengths of one method to compensate for the weaknesses of the other by providing both a structural account (through quantitative research) and a sense of process (through qualitative research) (Bryman, 2006).

In this study, bibliometric analyses were supplemented with survey data and interview data to provide insights into process characteristics, influential factors, and contextual information of emerging fields. These bibliometric findings, including visuals as well as typical scenarios from the quantitative analysis, served as elicitation tools for focus group discussions. This approach facilitated deeper exploration of the observed trends and patterns identified in the bibliometric data.

Furthermore, findings from bibliometrics and a survey were enriched through in-depth interviews. Quantitative data guided the selection of interview participants, ensuring that interviews offered contextual understanding and typical characteristics that illustrated and enhanced the quantitative findings. Interviews enriched and detailed results from focus groups, survey and bibliometric analysis, further validating the stories of impact.

Figure 1 illustrates the methods applied to answer the different steps of the mixed methods study and their interconnections

Figure 1: Overall mixed methods approach of the study



The following sections provide an overview of the individual methods and their implementation throughout the course of the present study.

3.2 Bibliometrics

3.2.1 Data Collection

Data acquisition is a crucial step in any bibliometric analysis. It determines the value and the meaning of the statistics that are calculated. The data selection for WWTF-funded research was performed using registered publication references (publication years 2013–2022) provided by WWTF, which were matched against Web of Science (WoS) data and supplemented with publications that acknowledged the mentioned funding agency.

For the benchmark funding agencies (FWF and ERC) in this study, we collected publications using acknowledgments, while we collected publications for the Vienna region, using the affiliations of authors. If at least one author was affiliated to an institution from the region, a publication was selected representing it.

The CWTS Citation Index (CI) system was used for the analyses. The core of this system is comprised of an enhanced version of the various Clarivate's citation indexes: WoS version of the Science Citation Index, SCI (indexed) Social Science Citation Index, SSCI, Arts & Humanities Citation Index, AHCI and the Proceedings Citation Index (CPCI).

Each publication in WoS has a document type. The most frequently occurring document types are 'article', 'book review', 'correction', 'editorial material', 'letter', 'meeting abstract', 'news item', and 'review'. In the calculation of bibliometric indicators, we only consider publications of the document types 'article' and 'review'. In general, these two document types cover the most important scientific publications.

We worked with publications of research funded by WWTF, collected publications with an acknowledgement to other funding bodies (ERC and FWF) and publications with an author affiliation within the Vienna region. The publications on research funded by WWTF were collected in two ways. WWTF provided us with publications registered as direct publications and matched with the CWTS-WoS database and those in WoS with an acknowledgment to WWTF. The numbers per year are in Table 1. *N*

pubs is the number we were able to collect, while P[full] is the number we used in the analysis, because they contain all the information we need for the analysis.

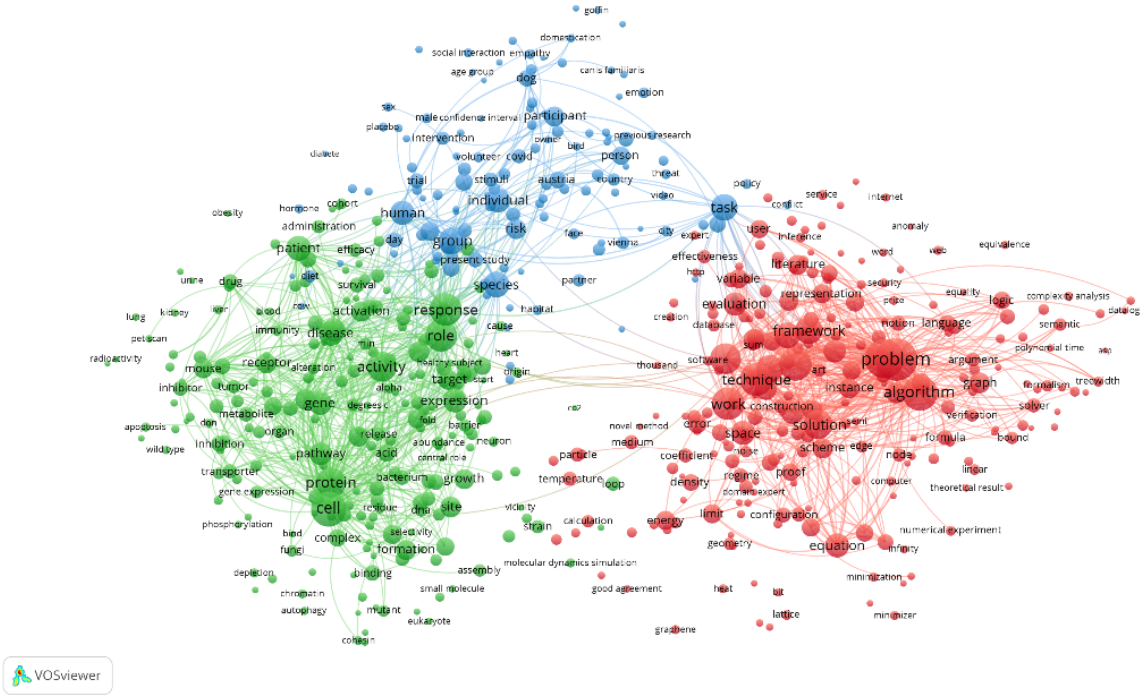
Table 1: Publications of research funded by WWTF per year

Pub Year	N pubs	P [full]
2013	183	173
2014	231	224
2015	222	214
2016	246	232
2017	280	261
2018	227	210
2019	268	253
2020	275	263
2021	320	296
2022	225	201
2023	257	
Total	2,734	2,327

It should be mentioned that 40% of the output was collected through direct publications registered by WWTF, while 60% of the output was collected by an acknowledgment to WWTF.

The WWTF output we collected is visualized by terms from titles and abstracts in a network (Figure 2). The position of these terms is defined based on co-occurrence (if terms co-occur in a publication, they are close to each other, while those with little or no shared publications are at a distance from each other). Therefore, there is no meaning of terms being on the left, right, top or bottom. What counts is the position the terms have in relation to each other. On top of the position, we added a color-coding based on clustering. Thus, we enable to some extent the interpretation of the network.

Figure 2: Network of key terms in titles and abstracts of publications representing research funded by WWTF.



Data: CWTS WoS database – WWTF publication set (VOSviewer thresholds: 10 occurrences, Resolution: 0.9, attraction:3)

In the network, we identified Cognitive sciences (blue region), mathematics and computer science (green) and biomedical sciences (red). We will use this map to discuss a couple of characteristics of the research funded by WWTF.

Furthermore, we collected publications from benchmark funding agencies and the Vienna region. We realized that the mission and focus of other funding agencies (and of the Vienna region at large) differ from the mission and focus of WWTF. Therefore, to match to some extent the results of the benchmark publications to WWTF, we applied a filter by considering only publications in research areas where WTTF has at least one. The numbers in Table 2 provide the numbers for WWTF and the benchmarks at large and the numbers filtered by the WWTF areas.

Table 2: Output WWTF and benchmarks at large and within the focus of WWTF funded research 2013-2022

Unit	All publications	Filtered by WWTF profile
WWTF	2,327	2,327
Vienna	110,792	36,633
ERC	152,523	53,051
FWF	40,995	15,567

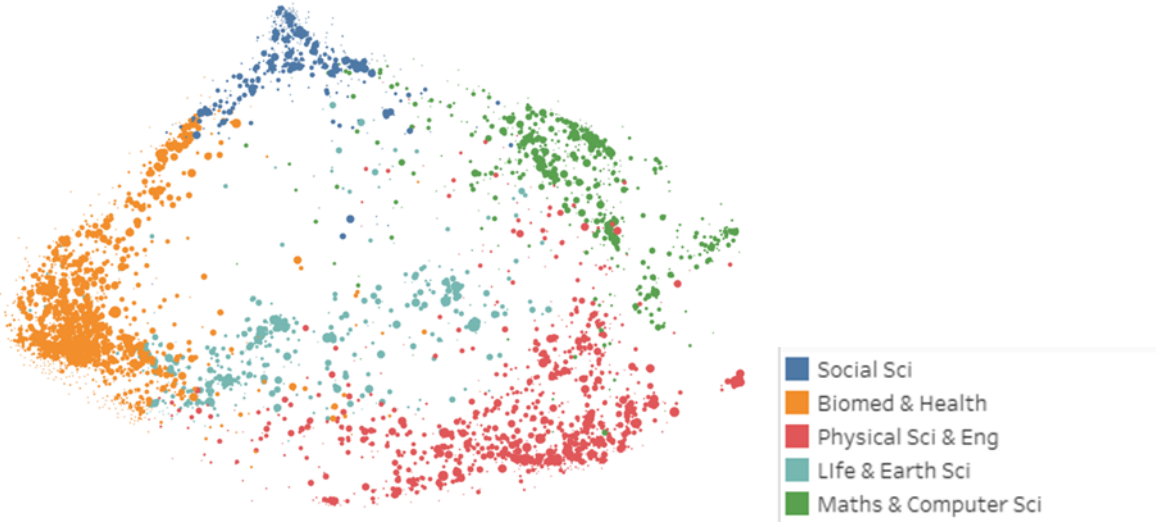
3.2.2 Analytical framework: the science landscape

In studies like this, where the output of a unit is assessed on its scientific impact and additional qualities, we use a framework in which all research is represented worldwide. This framework is referred to as the CWTS publication level classification. All publications of the database are grouped into clusters on the basis of their references and citations. The approach (Waltman and van Eck, 2012)

yields a self-organized structure of all sciences in which the source (journal) does not play any significant role.

A common way of visualizing the landscape of science by the publication clusters is a 2-dimensional map. In such a landscape, we position publication clusters in relation to each other based on citation traffic. We refer to these clusters as research areas. The denser the traffic between two areas, the closer they are. In other words: only the distance between areas matter. The X and Y axes have no specific meaning. Furthermore, the size of an area represents the relative volume (number of publications included), while the colour coding adds a clustering labelled by main disciplines.

Figure 3: Landscape of all sciences



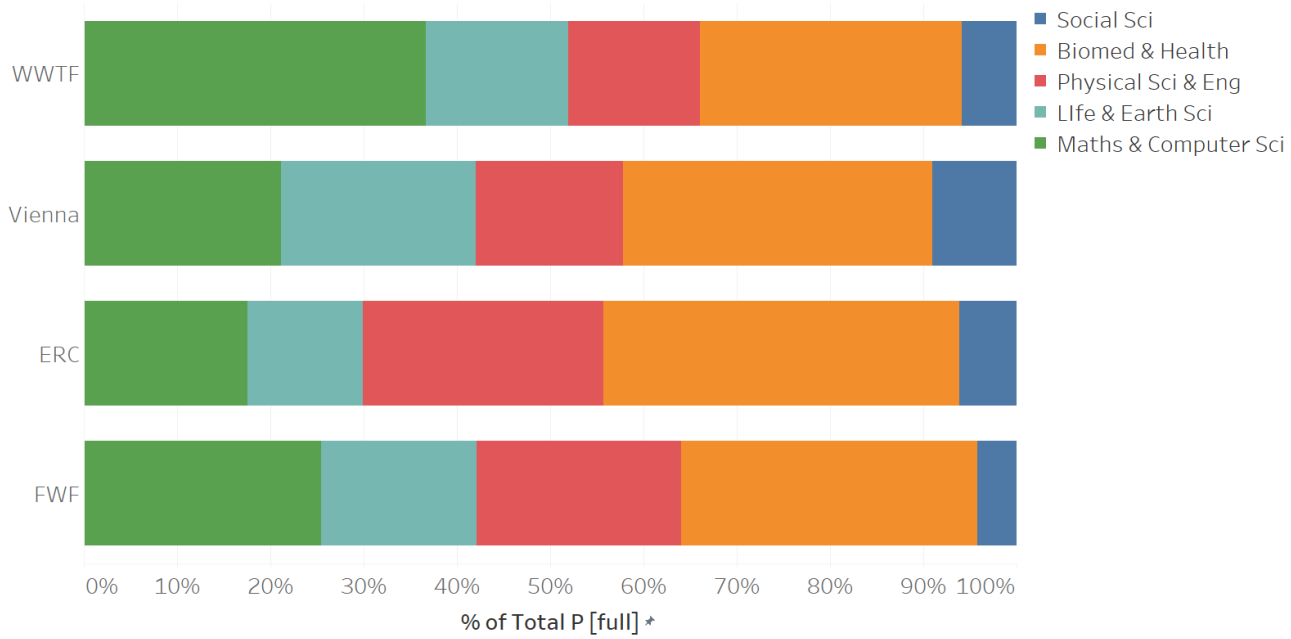
Data: CWTS WoS database, version 2413

We will position the research funded by WWTF and the output of benchmarks in the areas of this landscape and use the characteristics of each of the areas to normalize or interpret the results.

3.2.3 Benchmarking

Specific parts of the WWTF evaluation regards benchmarking, i.e., the results for WWTF will be compared to the results of two other funding bodies and the Vienna region at large. In the section on data collection, we have already referred to this approach in terms of how publications were collected to represent them. It should be noted that these three entities are not the perfect benchmarks. In Figure 4 we developed a visualisation of the content/ focus of the four entities.

Figure 4: Research profile of WWTF and benchmarks using main disciplines of the science landscape (WWTF areas only)



Data: CWTS WoS database version 2413

This bar chart nicely reflects the unique profile of WWTF, even within the selection of areas from the landscape based on the WWTF focus.

3.2.4 Bibliometric indicators

The indicators we introduce in this study relate to specific aspects of the assessment. We identify three types (output, scientific impact and area-based indicators).

Table 3: Output indicators

N pubs	The number of publications included in the output analyses. These concern the publications provided by WWTF matched with WoS, plus the ones identified by CWTS using author affiliations.
P [full]	The number of publications (N pubs), full counting, included in the citation analyses. Non-citable items (editorials, meeting abstracts etc) are not included. This is the reason why the numbers may differ from 'N pubs'.

Table 4: Scientific impact (citation-based) indicators

TCS	The total citation score. This represents the total number of citations accumulated within the citation window (see parameters), excluding author self-citations.
MCS	The average number of citations received by a publication (TCS/P[full]).
MNCS	The mean normalised citation score. This represents the field and year normalised average citation score per publication. Normalisation is based on a detailed publication classification system of CWTS, consisting of about 4000 fields and the year in which it was published. The average MNCS in the entire database is 1. Scores higher than 1 reflect a citation-based impact that is higher than the world average.

P [top 10%]	(not always included but the basis of the different PP[top 10%] indicators) The number of publications, that belong to the top 10% of their area. The area is determined based on a detailed publication classification system of CWTS, consisting of about 4000 fields.
PP [top 10 %]	The proportion of publications (P [full]) belonging to the top 10% most cited of their area and in the same year. The area is determined based on a detailed publication classification system of CWTS, consisting of about 4000 fields. The PP[top10%] in the entire database is 0.10 (or 10%). A score above 0.10 represents impact that is higher than the world average.

Table 5: Area-based indicators

ABC [industry]	The share of publications in a research area (publication cluster) (co-)authored by/with a company, normalized by the share in the entire database.
ABC [npl]	The share of publications in a research area (publication cluster) cited in at least one patent, normalized by the share in the entire database.
ABC [news]	The share of publications in a research area (publication cluster) mentioned in news articles, normalized by the share in the entire database.
ABC [policy]	The share of publications in a research area (publication cluster) cited in policy documents (Overton), normalized by the share in the entire database.
ABC [clin GL]	The share of publications in a research area (publication cluster) cited in clinical guidelines, normalized by the share in the entire database.
Field Growth	The growth (in terms of publication output) of the areas (publication clusters) in which an institute published. This growth indicator measures the share of output in the most recent two years, compared to a longer period. If there is no growth (stable output throughout), the share of the most recent 2 years is 0.1 of a period of 20 years. In that case the Field Growth is 1.
ABC[KB div]	A specific type for characterizing interdisciplinary research is an indicator for knowledge base diversity. This indicator is calculated at the level of research areas. It measures the average cognitive distance between cited references in a publication. The cognitive distance is defined by citation traffic between subject categories in the database. If all references are in the same category, the value is 0. If the average distance is equal to the maximum distance (i.e. no citations between the cited categories), value is 1.

The indicators and approaches in the bibliometric analysis relate to the main topics of the report as indicated in Table 6.

Table 6: Distribution of bibliometric indicators over key topics of the report

Indicator	Quality	Contribution to Vienna	Collaboration & Interdisc.	Stories
Production	x	x	x	x
Scientific impact	x	x		x
Societal potential	x	x		x
Research field evolution (growth)		x		x
Knowledge base diversity			x	x

3.2.5 Tools and approaches

For our analyses, interactions, and report, we used two key applications: Tableau and VOSviewer.

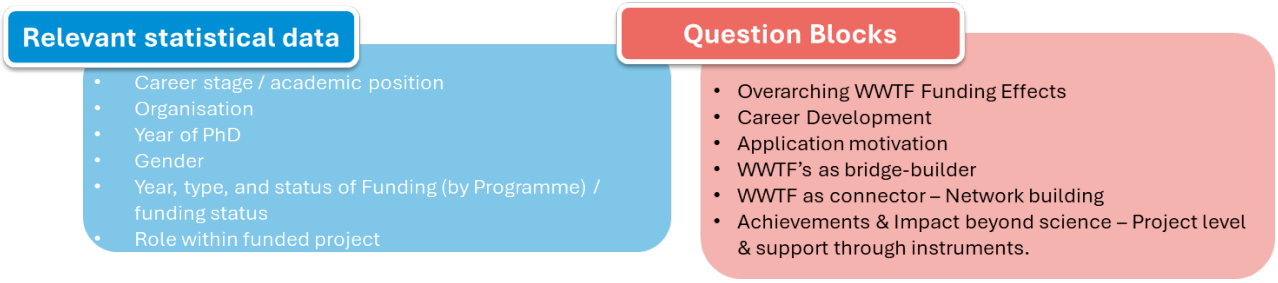
Tableau provides a web-based platform to dynamically create visualizations and results, allowing filtering and change foci. This platform was used to create the results in this report and to exchange information with partners in the project.

VOSviewer is a network tool. We created and used collaboration networks and term maps to explore content and dive deeper in the results.

3.3 Survey Method and Respondents

As part of the mixed methods approach employed in WWTF's study, a comprehensive survey was developed and distributed to a selection of WWTF's funding beneficiaries (442 recipients). The survey aimed to gather evidence addressing all evaluation questions (described in Chapter 2) and to collect statistical data relevant to the study. The survey included distinct sections designed to capture insights on overarching funding effects, impacts on career development, motivations for application, and other relevant topics. This structured approach ensured the collection of both qualitative and quantitative data, enhancing the overall data collection process.

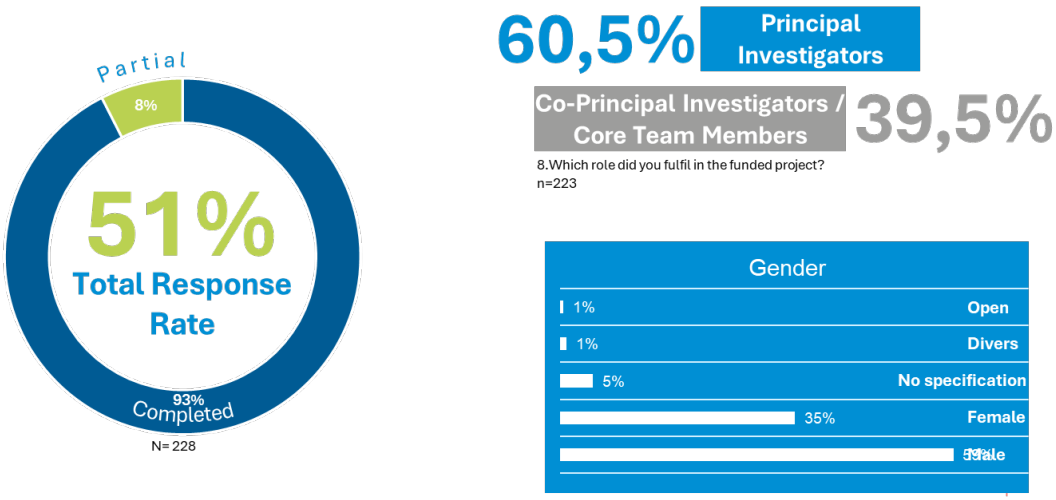
Figure 5: Structure of the Online Survey



The survey was active for a total of two weeks from October to November 2024, achieving a total response rate of 51% (N=228) from which 93% were completed questionnaires and 8% partially completed. The survey collected answers from Principal Investigators[1] (60.5%) and Co-Principal Investigators and Core Team Members (39.5%). The respondent group comprised 59% male and 35% female participants. Overall, 36% of respondents hold a Full Professorship, 17% are Senior Researchers, 15% are Associate Professors, and 11% are Assistant Professors (see respondents' career stage in 8.1 for a complete overview).

[1] WWTF's funded research projects have as requirements the lead of one to three experienced Principal Investigators (PI)

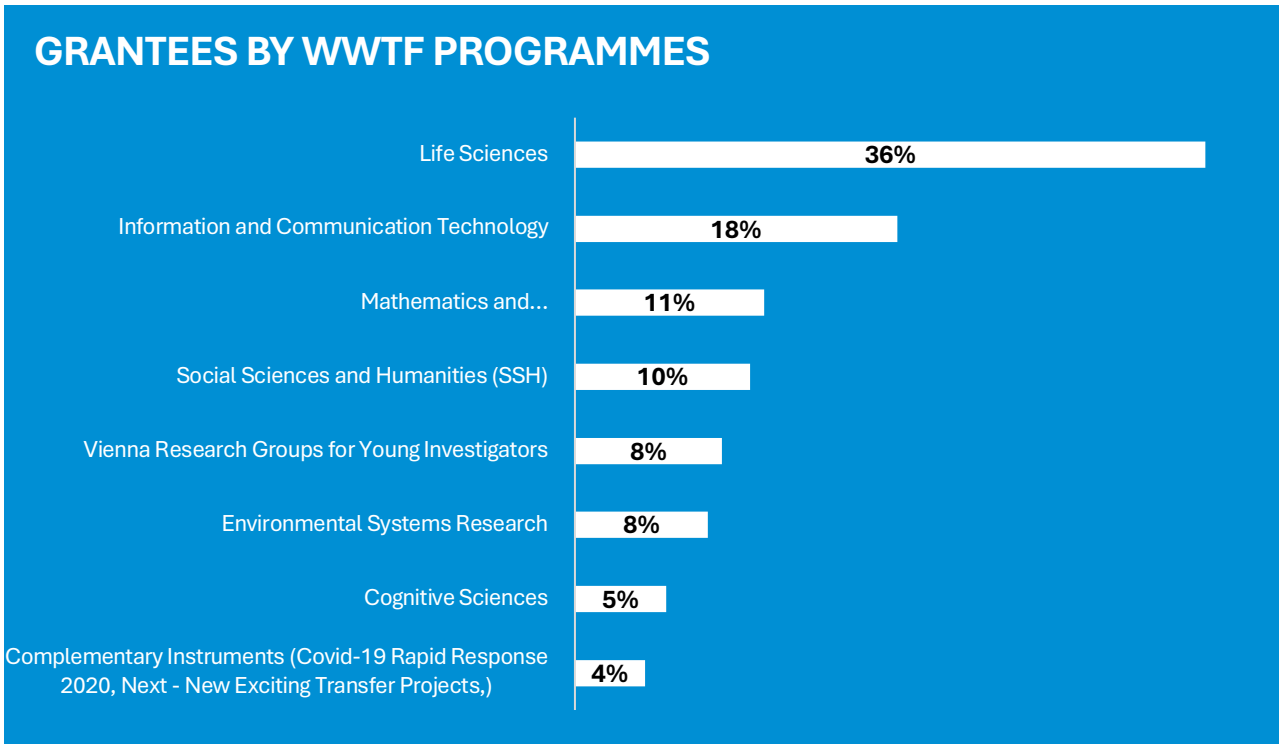
Figure 6. Overview of survey respondents



Survey respondents, categorized by WWTF's thematic programs, came predominantly from the Life Sciences program (36%), followed by the Information and Communication Technology (ICT) program (18%). This distribution aligns closely with WWTF's long-standing thematic design and orientation, as the Life Sciences program was introduced in 2003 and the ICT program in 2008. Their earlier establishment and recognition within the research area and the scientific community have likely contributed to their higher application rates, reflecting their well-established reputation and familiarity among potential applicants.

Furthermore, survey results indicate a majority of responses coming from participants with ongoing projects, primarily funded in 2019 or later. This distribution is important to consider, as it may influence responses related to expected results and impacts.

Figure 7: Under which type of WWTF programme have you received funding?



Data: Survey 2024, launched within the evaluation of Vienna's Science and Technology Fund WWTF
Multiple choice, n= 251

3.4 Focus Group

For the qualitative data, we first conducted a focus group with high-level representatives of research institutions in Vienna.

The aim of the focus group was to gain multi-perspective insights into the role and impact of WWTF in shaping Vienna's scientific landscape.

The focus was less on individual experiences with WWTF and more on general assessments of its influence on developments within Vienna's research area. The aim was to gather insights that could provide answers to questions regarding the WWTF's impact on emerging fields, its role in fostering connections between actors, and its partnership with research institutions.

Sampling strategy:

The focus group was composed of four experts from the Vienna research area, with additional representation from Lower Austria. Participants were selected through a purposeful sampling strategy (Palinkas 2015), targeting individuals with extensive experience and familiarity with WWTF. This strategy ensured the inclusion of "information-rich cases" that could provide both a broad overview (bird's-eye view) and internal perspectives on Vienna's research landscape. Efforts were made to achieve heterogeneity of viewpoints, encompassing diverse experiences and positions within the research community (Morgan & Hofman, 2018).

Figure 8: Composition of the focus group

The focus group was conducted online and lasted approximately 90 minutes. The discussion was guided by open-ended questions designed to encourage participants to share detailed perspectives and engage in meaningful dialogue. A secondary objective was to foster discussions that could help validate the initial bibliometric findings generated during the study.

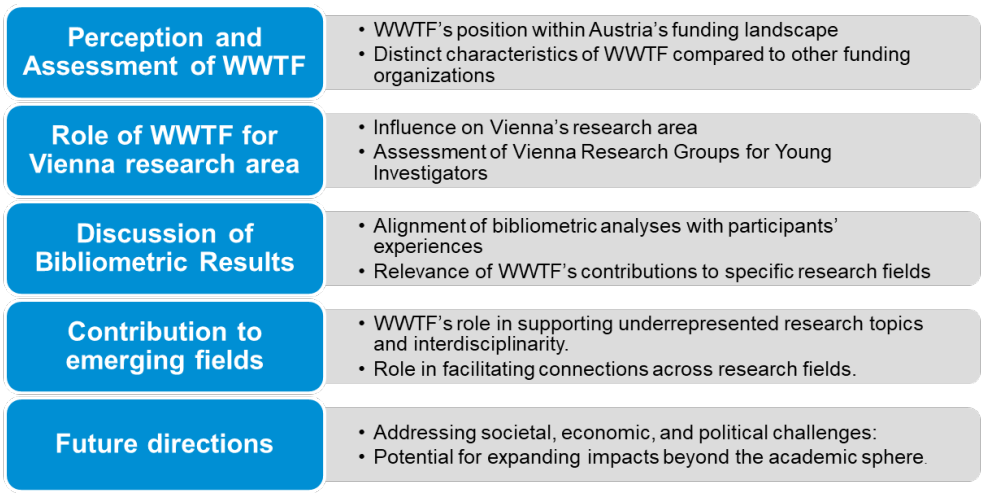


Figure 9: Overview about the topics discussed in the focus group

3.5 Interviews

Interviews served as the final step in the data collection process, designed to integrate and expand upon initial findings from bibliometric analysis, survey responses, and the focus group discussion. The interviews were strategically developed to build on these preliminary results, with their design and execution guided by insights gathered during earlier phases of the study.

Customized interview guides played a central role in this methodology. While they included similar core questions to enable comparison across findings, the guides were tailored to each interviewee's unique perspective and expertise. This customization ensured that the interviews captured specific, valuable insights relevant to the study's objectives (Froschauer & Lueger, 2020). To further enhance relevance, the guides incorporated elements from the "Stories of Impact", allowing interviewees to validate findings by connecting them to real-world contexts.

Table 7: Sampling dimensions

Institution	Area of expertise for the evaluation questions
University of Vienna	Vienna research area, VRG, COVID 19, science communication, Interdisciplinarity
VRG group leader	VRG, Vienna research area
TU Wien	Digital Humanism, interdisciplinarity
City of Vienna	Vienna research area, smart city
Business Incubator	Vienna research area, beyond science impact
Medical University of Vienna	Precision Medicine
WWTF	Complementary internal perspective
Federal Ministry of Education, Science and Research	Data advocacy

Interviews were conducted in a flexible manner, enabling the conversation to adapt to new or unexpected knowledge shared by participants (Froschauer & Lueger, 2020). This adaptive approach ensured that emerging insights were fully explored, contributing to a comprehensive understanding of WWTF's role and impact. A total of seven online interviews were conducted, each lasting approximately 55-70 minutes.

3.5.1 Interview Analysis

The qualitative data analysis within the WWTF study employed a two-stage approach to ensure a thorough and reliable examination of the collected data. This method combined inductive and deductive techniques. The first stage, inductive coding, involved initial and focused coding to uncover recurring patterns and themes within the data (Charmaz, 2011). Through this process, key categories were developed based on emerging insights, providing a foundation for deeper analysis and interpretation. In the second stage, deductive analysis was applied, utilizing the predefined evaluation questions as an analytical framework.

To guarantee the quality and robustness of the analysis, several measures were implemented. Methods triangulation, within the mixed methods framework of the study, was used to validate findings by comparing insights across different data sources and methodologies. Additionally, the analysis accounted for the heterogeneity of perspectives gathered from diverse stakeholders, ensuring that a wide range of viewpoints was represented. Representativeness of concepts was also a key consideration, further reinforcing the reliability and applicability of the findings.

3.6 Synthesis of Method

The results from these diverse methods were integrated into comprehensive results to provide multi-method evidence for the respective evaluation questions. This synthesis not only explained the quantitative patterns observed in the bibliometric analyses but also contextualized these patterns through insights from surveys, focus groups, and interviews. The integration of these methods ultimately enhanced the understanding of the work of WWTF, offering a robust and multifaceted perspective.

4 RESULTS

Chapter four presents the results of the mixed methods study along the four evaluation questions

4.1 The quality of the scientific output of WWTF funded projects

This chapter delves into the quality and excellence of the scientific output supported by WWTF. It examines how WWTF is recognized as a funding organization, the conditions it creates for fostering excellence, and the impact of its funding on the career development of researchers.

4.1.1 Recognition of WWTF

Analyzing the recognition of WWTF as a sub-category within the quality of scientific output aimed to reflect how external perceptions align with WWTF's mission and objectives. To achieve this, data were collected to **capture perspectives on how WWTF is perceived by key actors within Vienna's research area**, including representatives from universities and research institutions, policy actors at the city and ministry levels, and a representative from a business incubator. Additionally, we assessed the **recognition of WWTF among funding beneficiaries** (n=210) through a survey in which respondents indicated their level of agreement with various statements reflecting WWTF's mission and objectives.

To understand the results of external perceptions of WWTF, it is important to consider the **context of research funding in Austria** and highlight the main differences and outstanding characteristics of WWTF when compared to other funding agencies. This **information is provided by WWTF in its SAR**. First, WWTF represents an exception for funding academic institutions (exclusively) at the regional level, considering that funding agencies at the regional level are owned by their governments and show a strong tendency to fund firm-based innovation. Further, at the national level, WWTF shows strong focus on basic research when compared to other national funding agencies (e.g. FFG). Here WWTF's funding stands out through its thematic programming, its high interdisciplinarity focus and a stronger orientation towards high talent attraction (see Table 8). Further details on the research landscape can be found within Chapter 4 of WWTF's SAR.

Table 8: Uniqueness of WWTF: A comparison with FFG, FWF by WWTF

WWTF	FWF	FFG
Regional (Vienna)	National	National
Strong focus on science	Strong focus on science	Strong focus on technology and applications
Thematic programming	Only bottom-up	Largely thematic programming
(Moderate) mission orientation through topics	No mission orientation	Partly mission orientation through topics and target groups
High interdisciplinarity	Low interdisciplinarity (but rising in recent programs, e.g., Cluster of Excellence, Emerging Fields)	Academia, when funded, collaborates with companies
High talent orientation (VRG)	High talent orientation (ASTRA) however, START program (= ERC StG equivalent) ended in 2023	No talent programs
Annual budget (2023): 19m €	Annual budget (2023): 380m €	Annual budget (2023): 680m € (about 30% goes to universities)

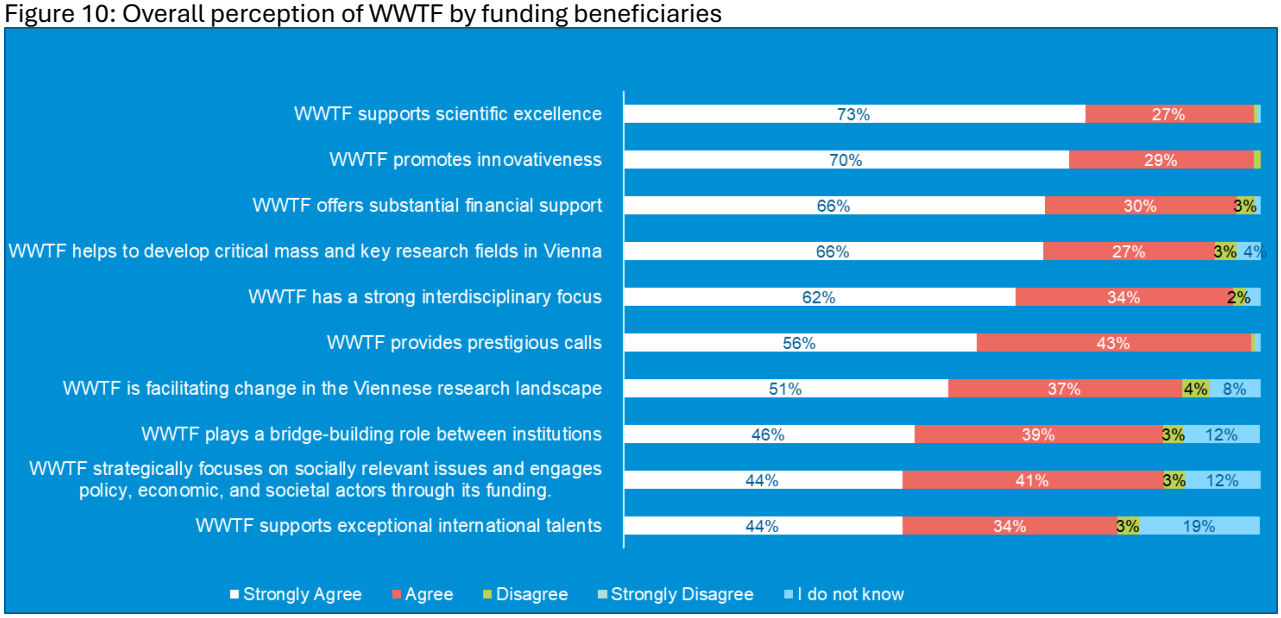
Data: Table provided by WWTF

In both the focus group and the interviews, all participants were asked what makes WWTF distinctive. It became evident that all participants spontaneously emphasized that WWTF is unique within Vienna's funding landscape. The arguments can be summarized as follows:

- WWTF **funds excellent basic research** and strives to **make this research both accessible and relevant**.
- WWTF is **more than just a funding agency**; it actively contributes to Vienna's research ecosystem and aims to **partner with society in ways that promote and advocate for science**.
- WWTF **fosters innovative forms of funding** and encourages interconnected, multidimensional thematic approaches.
- Moreover, WWTF is characterized by its **agility and flexibility**, allowing it to **respond effectively to current developments** and act as a catalyst for new ideas and initiatives.

These perceptions of WWTF align very well with the results of the survey.

Figure 10: Overall perception of WWTF by funding beneficiaries



Question 9. Please indicate your level of agreement with the following statements about WWTF:
Data: Survey 2024, launched within the evaluation of WWTF
n= 210

Survey results highlight WWTF's strong recognition as a key supporter of scientific excellence and a promoter of innovation. A significant majority of respondents **(99%) agree that WWTF plays an important role in advancing scientific excellence**, reflecting the organization's strong alignment with its core mission. Similarly, the promotion of innovativeness receives broad acknowledgment, with **participants recognizing WWTF's role in promoting innovativeness**. In terms of financial support, 66% of respondents strongly agree that WWTF **provides substantial funding**, furthermore, WWTF's commitment to interdisciplinary research is highly valued. All in all, 96% of respondents either strongly agree (62%) or agree (34%) that the organization maintains a **strong interdisciplinary focus,** with minimal disagreement (2%). This underscores WWTF's role in bridging research fields and fostering collaborations that transcend traditional disciplinary boundaries. Overall, survey results depict the perception of WWTF as an influential actor in Vienna's research area, both in terms of scientific excellence and through its ability to catalyse innovation, interdisciplinary collaboration, and strategic research development.

The results of our study show that WWTF is widely recognized for its distinctive approach to funding, characterized by several **key strengths**:

Unique support for scientific excellence, closing (research) gaps – the analysis of our focus groups and interviews revealed that WWTF is recognized by its **crucial role in filling a critical funding gap for basic research**, particularly within the social sciences, computer sciences (ICT), and technical sciences, where funding for basic research and its translation into practical applications is challenging in Austria. WWTF is described to enable researchers to address pressing societal issues while fostering interdisciplinary collaboration and knowledge exchange. Focus group participants and interview partner emphasize that this strategic focus complements and enhances existing funding mechanisms for innovative research bridging theory and practice.

Innovative funding formats – WWTF's recognition is characterized by a unique ability to design and implement **innovative funding formats**, defined by a highly attractive thematic focus of funding calls, as well as by the substantial amount of funding provided (see Figure 10). Such innovative **formats**

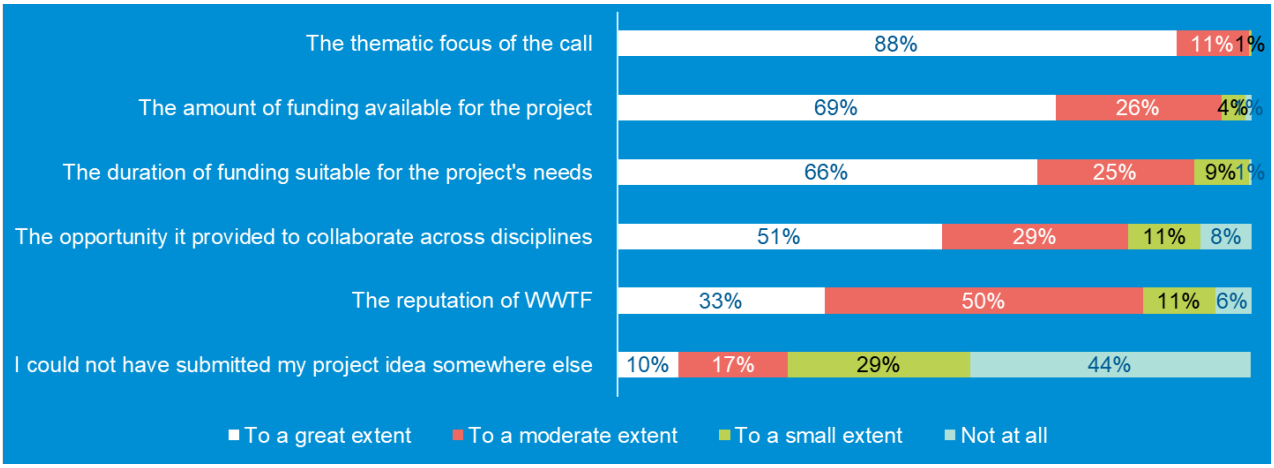
follow a wider thematic scope, allowing WWTF to **effectively supports emerging research areas** and act as a catalyst for new ideas and initiatives. The wide thematic focus is also **linked to enabling interdisciplinarity**, as it fosters the collaboration of a variety of disciplines within calls.

Strategic thematic design and interdisciplinary programs – the strategic design of program themes (incl. call design) is highly recognized as one of WWTF's assets in the focus group and in the interviews. This design leads to a **high degree of perceived alignment**, as well as to **complementarity within Vienna's research area**. The strategic design is reported to care for the **alignment with international standards** while **actively shaping the local research landscape**, thus strengthening existing strengths and fostering new emerging fields. Furthermore, WWTF is highly valued for its **genuine impetus towards interdisciplinarity**, as it includes mechanisms that enable collaborations (and partnerships) across disciplines and institutions for the creation of (new) knowledge, the co-creation of methodologies and the sharing of data and results (see Figure 11). Thus, it encourages the development of critical mass and advancement of key research fields.

Agile and flexible operations – WWTF is highly recognized by its **quick response and flexibility**, being able to react in a timely manner to current developments. Related to flexibility, WWTF is also recognized by the strong focus it provides for Vienna and its science community.

Excellent basic research and… – WWTF's recognition extends beyond funding excellent basic research. Its commitment to **accessible and highly relevant research** has been consistently highlighted in the focus group and interviews throughout the study. Moreover, WWTF is acknowledged for its **proactive role in facilitating research translation (application)** across its various activities, fostering **connections between disciplines, institutions, and actors**. Our interview partners further highlighted that advancing basic research also demands **adaptive and integrative approaches**, which WWTF demonstrates by embedding projects **within real-world contexts**, ensuring their broader impact and applicability.

Figure 11: WWTF's attributes (attractiveness)



Question 10. To what extent did the following aspects influence your decision to apply for WWTF funding?
Data: Survey 2024, launched within the evaluation of WWTF
n= 210

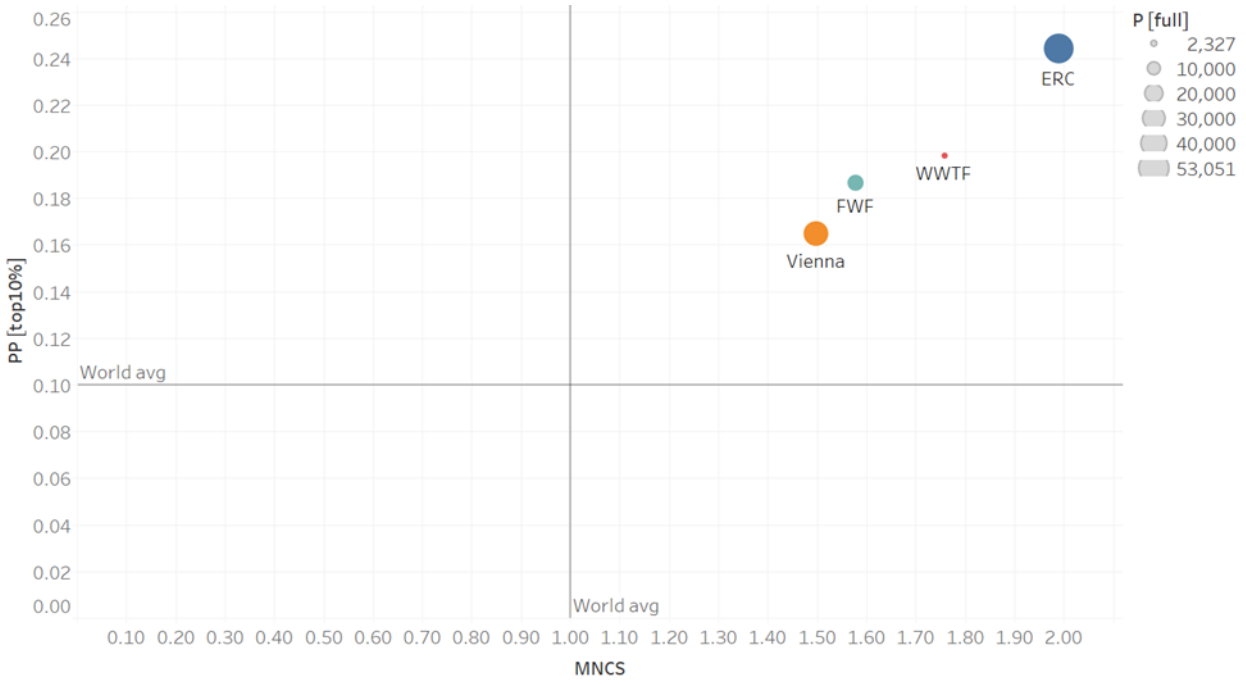
4.1.2 Quality and Excellence of Scientific Output

The most common and well-known bibliometric indicator for quality and identifying excellence is citation-based. The most well-known indicator is the (journal) Impact factor (IF or JIF), which estimates the impact on the basis of the citations received by papers published in the journals in which an

institution or person has published. Because it is based on all papers in those journals and not on the papers from that institute/ person only it reflects an indirect impact. For this reason and a couple of others, this indicator is heavily criticized. In this study we **assess quality by an indicator that measures the impact of a paper**, **normalized by the research field (area) to which it belongs** (and that they are published in the same year). The two indicators are **MNCS (mean normalized citation score)** and **PP** [top 10%] (the proportion of top 10% most highly cited). These indicators reflect the same impact in a different way. The MNCS is an average (sensitive to outliers), while the PP [top 10%] is a proportion indication (not sensitive to outliers).

In Figure 12, we visualized the relations between the four entities (WWTF, FWF, ERC and Vianna region) using both indicators. The size of the dots is defined by the number of publications, again reflecting the large differences in terms of output, hence available resources.

Figure 12: Citation-based scientific impact measurement as a proxy for research quality of WWTF and benchmarks



CWTS WoS database version 2413

Both impact indicators show the same picture. The outputs of all entities have a high impact of at least 50% above the world average (as indicated by the reference lines). The impact on the ERC, however, is way beyond the impact of others, including WWTF. With the mission of funding excellence, we can conclude that **WWTF indeed funds research with a higher impact than that of the Vienna region at large and the other national funding agency, FWF**. Its impact is, however, well below the other funding body supporting excellence, the ERC.

The impact of **output related to WWTF funded research is undeniably high at 80% above world average (MNCS) and twice the world average** (PP[top 10%]).

Results from the survey and the interviews highlight further quality and excellence of scientific outputs at project level. The following graphic presents the **ranking of most significant achievements as reported by survey respondents**. Respondents highlight the **creation of new knowledge**, the **development of innovative methods or approaches**, and the **high-impact publications** as the most significant project outputs. Establishing new interdisciplinary collaborations, supporting students' careers through teaching and training, and **contributing to real-world applications** follow in the ranking as notable outputs. The attraction of additional funding was mentioned to a lesser extent, along with building institutional capacities such as new research groups. Outputs contributing to reaching the broader public, presenting keynotes at high-profile events, and contributing to public policy received moderate mentions. Finally, the contribution to the development of start-ups was identified as the least frequently reported achievement.

Figure 13: Most significant achievements of funded projects

Question 19. What do you consider to be the most significant achievements of your funded project?
Data: Survey 2024, launched within the evaluation of WWTF

4.1.3 Conditions for Production of Excellence

The results of data collection (Interviews, focus group, and survey) revealed that the quality of projects funded by WWTF is significantly enhanced by the organization's efforts to **create and provide optimal conditions throughout the different phases of the funding process**.

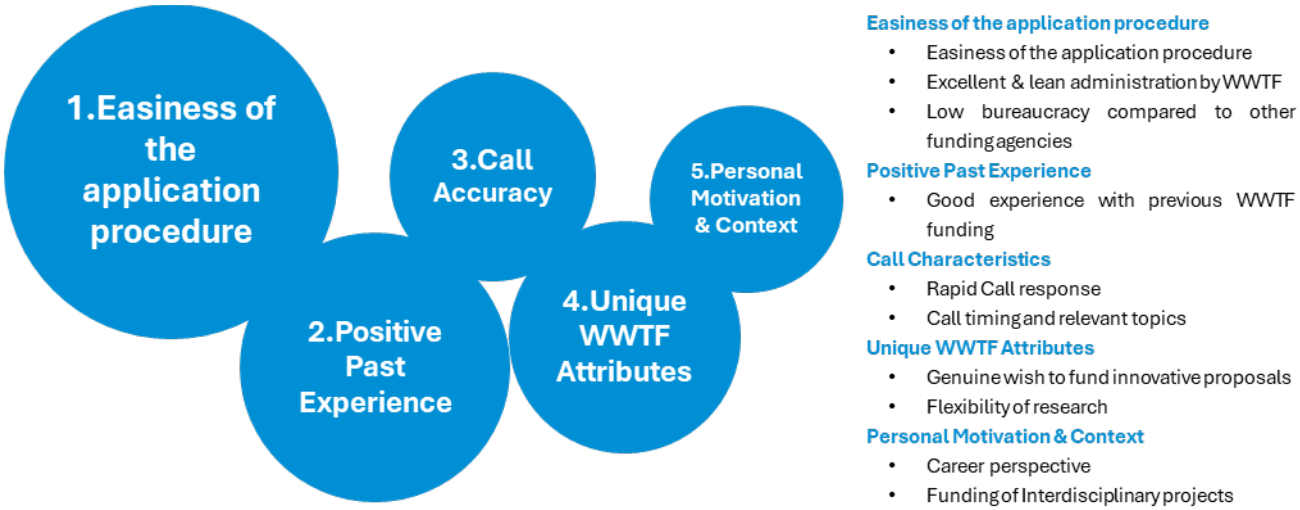
Rigorous quality control during the selection process, high selection standards and transparent processes enable WWTF to select the most promising projects. The innovative structure of the funding instruments encourages researchers to step out of their comfort zones, thereby fostering innovation within the projects. Projects are not only carefully chosen but also supported by favourable funding conditions, ultimately playing a key role in attracting top research talents. Long-term perspectives, robust financial support, and a deep understanding of the needs of researchers and their institutions ensure that **researchers and their projects are optimally supported**.

Furthermore, throughout the funding period, WWTF remains agile and responsive to the evolving needs of grantees, ensuring continuous support to enhance research quality. The rigorous selection process allows WWTF to place trust in the researchers, **creating space for creativity and enabling the research to thrive**. This creates an environment where **excellent outputs** can flourish and yield abundant results. However, WWTF also knows when to conclude funding for a program, specifically when a topic has become established and no longer requires further impetus.

In addition, results from the survey highlight further elements supporting the production of scientific excellence. These elements are recognized as significant drivers of research and are highly valued by funding beneficiaries. Key aspects include the **streamlined and efficient application process**, marked by **excellent administration and minimal bureaucracy** (compared to other funding agencies). Beneficiaries particularly appreciate the **clear and straightforward communication** as well as the **supportive and professional approach** throughout the process, which has contributed to a **positive and smooth experience** with WWTF. Another distinctive element is WWTF's **ability for rapid response and timely launching of calls**, which further enhances the conditions for excellence by enabling researchers to act effectively within their fields.

Additionally, WWTF is uniquely perceived as **genuinely committed to funding, supporting, and fostering innovative proposals.** Its flexibility in accommodating the diverse needs of research projects stands out as a defining feature. Finally, WWTF is regarded as a **key driver of personal career development**, with many beneficiaries citing this as a significant motivation for seeking funding.

Figure 14: Reasons for applying to WWTF funding (attractiveness)



Question 10. To what extent did the following aspects influence your decision to apply for WWTF funding? – Answers under Other (text entry)
Data: Survey 2024, launched within the evaluation of WWTF
n= 210

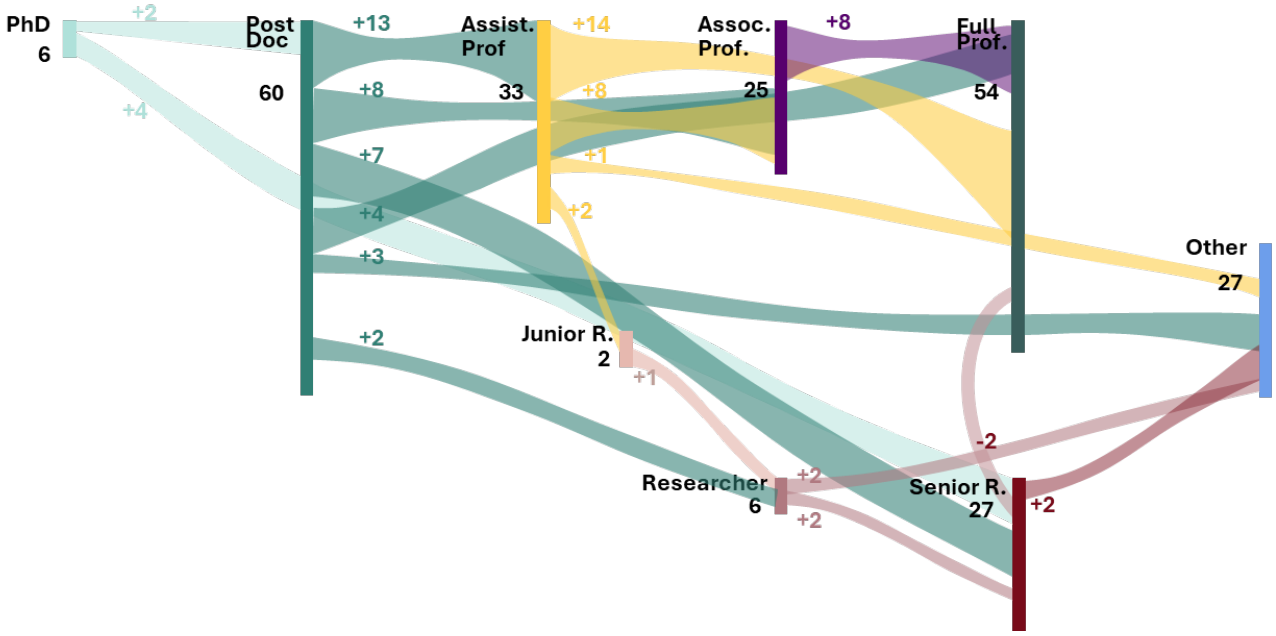
4.1.4 Career Development of Funded Researchers

Another aspect that we saw in our results as evidence of the quality of research funded by WWTF is career development of funded researchers. WWTF's funding is organized in activities along two main funding instruments, one of them focusing on research projects, the other on career development and

person-oriented funding, the latter implemented mainly through the Vienna Research Groups for Young Investigators (VRG) program. Through the VRG program, WWTF aims at attracting young talented researchers to Vienna and support their career development through funding schemes lasting 6 to 8 years.

Results in this section were collected mainly via the survey, gathering evidence on the career path of survey participants, mainly funding beneficiaries. The approach tracked the academic evolution by **comparing their career stage at the time of funding** with their **current career stage**. Results revealed changes and career progression and provided insights into the personal impact of funding.[2] Breaking down survey results to study the most evident career paths of funding beneficiaries delivered the following results. **Most evident career development trends** can be observed in Figure 15, for instance, most participants that were post-docs at the time of funding (60 participants), were able to advance to assistant professor (13), associate professor (8), and senior researcher (7). The most notable trend can be observed in Assistant professors (33 at the time of funding) that advanced to Full Professors (14) after funding. These developments clearly demonstrate the **positive impact of WWTF funding on the career progression of supported researchers**.

Figure 15: Career Development



Data: Survey 2024, launched within the evaluation of WWTF
n=222, self-elaboration

In addition, **WWTF closes gaps in early-career support**. Results from the bibliometric analysis underscore the uniqueness of WWTF funding in this area, highlighting the strong focus of WWTF in funding significantly younger researchers in comparison with other active funding agencies in Vienna (see Figure 16).

[2] See survey results in Appendix 8.1, Figure 34

Particularly through the Vienna Research Group for Young Investigators (VRG), WWTF fosters scientific output and career development, ensuring a sustainable and dynamic research environment for Vienna.

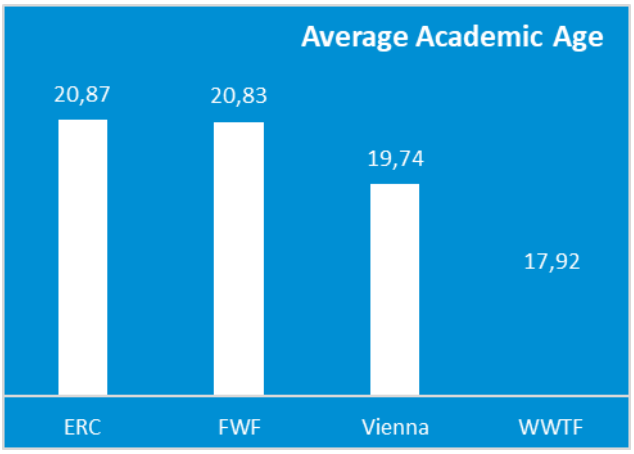
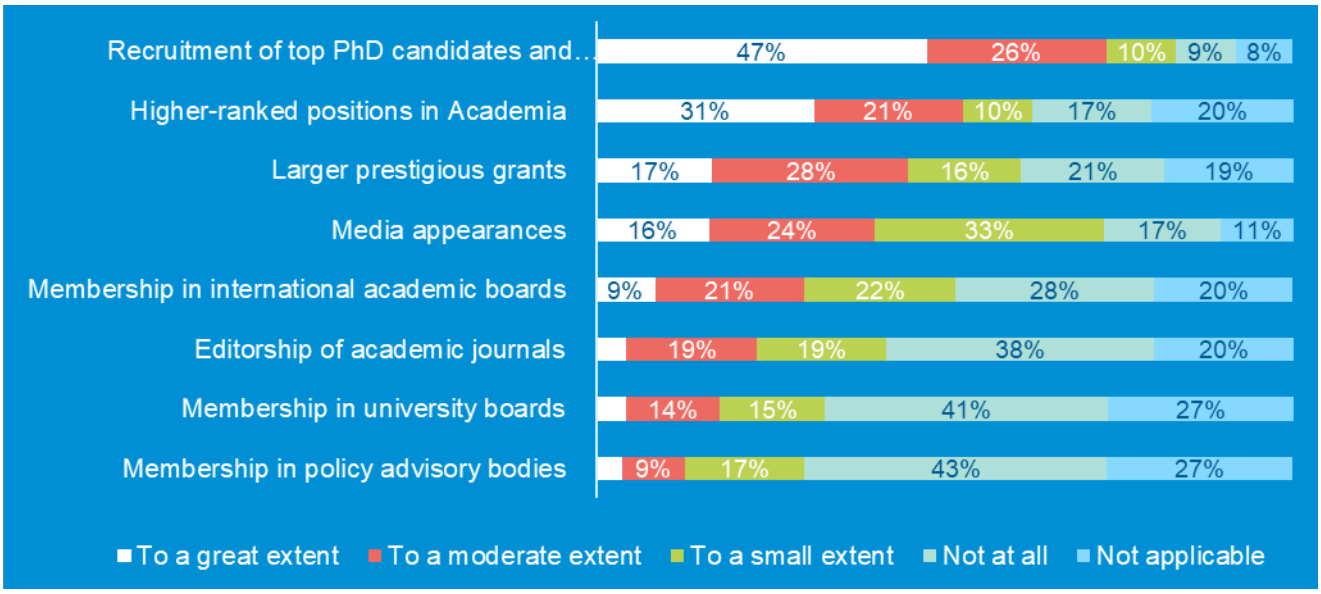


Figure 16: Bibliometric results of average academic Age of Grantees based on Corresponding authors

Furthermore, the survey collected beneficiaries' perceptions of the extent to which WWTF had enabled them to advance their careers or achieve certain results. Overall, 83%[3] of beneficiaries (n=209) consider WWTF's funding has a high **significant impact in the recruitment of top PhD candidates and Postdocs**, which can have an impact on excellent research. Additionally, **WWTF's funding has a significant impact on career development,** with 62% of beneficiaries (n=209) stating that funding enabled them to achieve higher-ranked positions in academia, as well as larger prestigious grants (61%). Less funding impact is perceived from beneficiaries in regard to obtaining higher media appearances, editorships or Membership in different boards and advisory bodies.

Figure 17: WWTF's impact on career development



Question 18. To what extent has the WWTF funding enabled you to advance your career? It helped to achieve/obtain...
Data: Survey 2024, launched within the evaluation of WWTF
n=209

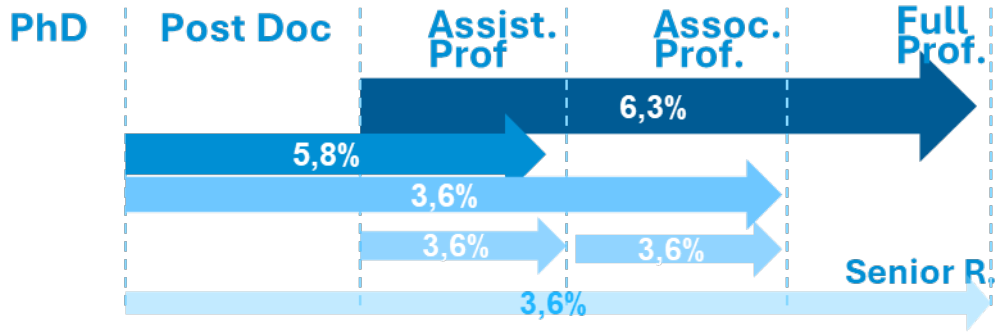
Since WWTF supports career development specifically through its VRG grants, results of Question 18 of the survey (Figure 17) were filtered to look at the answers of beneficiaries funded under the VRG program. These results show a slight but meaningful difference, presenting the **achievement of high-ranked positions in academia as one of the highest items (with 84% agreement, n=19),** followed by the **recruitment of top PhD and postdocs candidates** (overall 95% agreement, n=19). Particularly

[3] Involves all positive answers: "to a great extent", "to a moderate extent" and "to a small extent".

peculiar is the media appearance, which in this filtered sample appears in **third place with 84% of agreement** (see Figure 40 in Appendix 8.1).

Overall, **career advancement is strongly supported by WWTF funding**, highlighting its significant impact on beneficiaries' career trajectories. Support for career development is recognized as one of the primary outcomes by all beneficiaries, especially among **VRG grantees**, who reported that the funding helped them attain **higher-ranked academic positions** (see Figure 40). Additionally, the detailed analysis of career progression shows positive advancements across positions, with a notable 6.3% of beneficiaries (n=222) advancing from Assistant Professor to Full Professor roles following the funding to date. These findings underscore **WWTF's pivotal role in fostering both research excellence and significant career development opportunities**.

Figure 18: Career advancement of beneficiaries



Data: Survey 2024, launched within the evaluation of WWTF
n=222, self-elaboration based on results of Question 1

Further evidence from the **2021 evaluation of the VRG program** highlight the sustainable impact of WWTF funding on career development.[4] Findings of the evaluation show that a significant share of VRG leaders (beneficiaries) remain at their host institutions even after funding ends, with 13 out of 21 grantees (funded between 2010-2019) staying at their original host institution. This suggests that 66% of attracted research talent is likely to stay in Vienna and pursue long-term careers at their host institutions. For those who left Vienna, key reasons included better career prospects, more generous or accessible funding, and a lack of basic funding for their research group from the host institution.

4.1.5 Synthesis

WWTF stands out for its **strong focus on funding excellent basic research**, a strength highly recognized by actors within Vienna's research landscape and supported by bibliometric data. Its recognition **extends beyond basic research funding**, as WWTF is valued for its role as a connector—bridging disciplines, institutions, and actors to foster collaboration and support the translation of scientific knowledge. Stakeholders in Vienna's research community particularly emphasize that this excellent basic research is not only of high quality but also highly relevant, **effectively bridging the gap between fundamental research and regional applications**.

WWTF is further distinguished by its **innovative funding formats**, characterized by a broad thematic scope, strategic alignment, and a strong emphasis on fostering interdisciplinary work. According to

[4] VRG Program Evaluation 2021 – Accompanying Research. Available under: https://repository.fteval.at/id/eprint/595

funding beneficiaries, WWTF's support is perceived as **appropriate, attractive, and highly relevant**. The fund provides **optimal conditions for high-quality research** to thrive, marked by flexible and adaptable processes, rigorous quality control in project selection, and strategic shaping through targeted calls. At the same time, WWTF fosters a high level of trust by granting researchers the freedom to conduct their work independently. This trust is complemented by **strong organizational support**, with streamlined administrative processes designed to assist researchers throughout all phases of the funding cycle.

Bibliometric analyses highlight the exceptional quality of scientific output associated with WWTF-funded projects, demonstrating a significantly higher impact compared to other national funding agencies—80% above the world average (MNCS) and double the world average for publications in the top 10% (PP [top 10%]). This outstanding performance is evident in the generation of new knowledge, the development of innovative methods and approaches, and the **high impact of publications**, which beneficiaries identify as key achievements of WWTF-funded projects.

Finally, WWTF places a strong emphasis on **supporting early-career researchers**, significantly contributing to the career advancement of its funding beneficiaries and underscoring its positive impact on their professional trajectories.

4.2 Contribution of WWTF to the Vienna Research Area - Emerging Fields

The following chapter explores the extent to which WWTF has contributed to the development and strengthening of the Vienna research area. It examines the fund's role as a key partner for Vienna's research institutions, its support in advancing and fostering new topics and approaches, and its impact on the emergence of new fields and research directions within the region.

4.2.1 WWTFs Role in Strengthening the Vienna Research Area

All participants in both the focus group and the interviews confirmed that WWTF plays a significant role in strengthening the Vienna research area. This impact is not seen as a secondary effect but as a primary objective of the fund's work. The activities of WWTF contribute directly to the development of Vienna within the city's research ecosystem but also as a recognized research area.

A key aspect of this contribution lies in WWTF's ability to **identify and address gaps** within the local research landscape. Participants emphasized that the fund engages in **continuous, reciprocal communication with stakeholders in the scientific community**. This close dialogue ensures that emerging needs are promptly recognized and effectively addressed. By maintaining these connections with researchers, institutions, and other relevant actors, WWTF can direct its funding and initiatives toward areas where support is essential and strategically valuable for the Vienna research area , thus promoting progress in promising research fields.

In addition, WWTF plays **a strategic role in setting the research agenda** in Vienna. Through its mutually effective relationships with local political actors and other stakeholders, the fund helps shape the orientation and priorities of research activities within the Vienna research area. This agenda-setting **function ensures that Vienna's research efforts are aligned with both scientific advancements and societal needs**. Furthermore, WWTF's cooperation with the City of Vienna was highlighted as a factor that **enhances collaboration beyond the scientific community**. This partnership **fosters connections with non-academic actors and the business sector**, broadening the impact of research outcomes and encouraging interdisciplinary approaches.

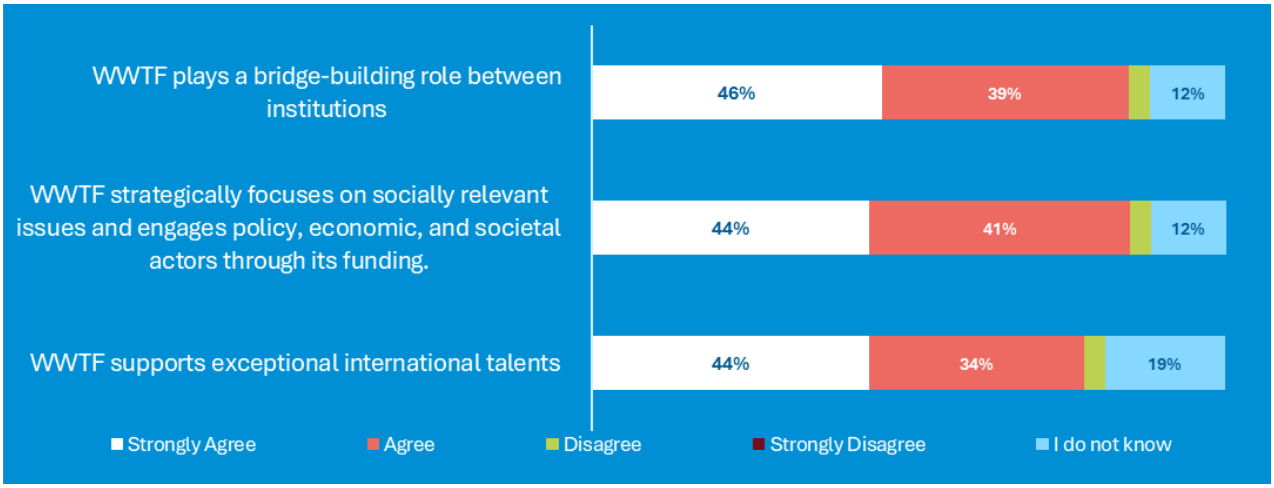
Another way in which WWTF contributes to strengthening the Vienna research area, as emphasized by interview partners and focus group participants, is through its **active engagement in media and other forms of science communication**. WWTF maintains a strong media presence to promote research and is actively involved in organizing and attending numerous events. According to our interviewees, this engagement plays a crucial role in **fostering the broad dissemination of scientific knowledge**. It represents an important and effective step towards increasing the visibility of science to a wider audience. This effect is supported by survey results (see figure 10), which show that media appearances are ranked as the fourth most significant achievement of projects funded by WWTF, with 73% of respondents indicating that WWTF-funded research enabled them to gain media appearance.

Overall, the insights from both the focus group and interviews demonstrate that WWTF **not only supports individual research** projects but also **contributes strategically** to the long-term development of the Vienna research area.

Survey findings highlight the pivotal role of WWTF in enhancing Vienna as a research hub. A total of 85% of funding beneficiaries (n=210) acknowledge **WWTF's significant contribution as a bridge-builder between institutions**. This role fosters collaboration across diverse organizations and disciplines, **creating synergies** that amplify the impact of research. Respondents also **recognize WWTF's strategic focus on addressing socially relevant issues**, actively engaging with policy, economic, and societal stakeholders. This inclusive approach ensures the high level of thematic alignment across programs with pressing challenges while promoting meaningful dialogue between academia and other sectors.

Furthermore, **78% of survey participants** (n=210) **agree that WWTF plays a crucial role in attracting exceptional international talents** to Vienna. By supporting researchers from around the globe, WWTF not only enhances the city's research capabilities but also contributes to the internationalization of Vienna's academic landscape. These efforts collectively strengthen Vienna's reputation as a center for innovation and excellence in research.

Figure 19: Sample from the overall perception of WWTF by funding beneficiaries



Question 9. Please indicate your level of agreement with the following statements about WWTF:
Data: Survey 2024, launched within the evaluation of WWTF
n=210

4.2.2 WWTF as Partner for Vienna research institutions and policy

WWTF as a Partner for Universities in Vienna

Interviews and the focus group highlight WWTF as a **highly valued and reliable partner for universities** in Vienna. Its partnership is characterized by a multi-perspective approach where WWTF actively listens to and understands the needs of both researchers and university administrations. This is reflected in their regular engagement through events, discussions, and continuous dialogue, **fostering a dynamic, evolving relationship rather than a static, one-time consultation**.

WWTF demonstrates a **deep understanding of the academic environment**, considering not only scientific excellence but also the administrative and regulatory frameworks within which universities operate. This **sensitivity facilitates smooth integration of initiatives like Vienna Research Groups and doctoral programs** into university structures, accounting for legal requirements and university-specific practices. By **attracting new, outstanding talent** through initiatives such as the Vienna Research Groups, WWTF strengthens universities. It also brings innovative approaches to university institutes and **enables the exploration of cutting-edge technologies** fostering advancements in key areas.

The funding provided by WWTF complements other sources (e.g., FFG, EU), offering **flexible support for basic research with thematic focus areas**, yet without overly rigid constraints. This flexibility is crucial for universities, allowing adaptation to changing institutional needs, including personnel-related adjustments. The **WWTF's flexibility, speed, and adaptability make it an invaluable partner** for universities, enabling them to establish and develop innovative fields more effectively. In return, **universities serve as the practical embodiment of WWTF's impulses**, bringing its vision to life and advancing Vienna's research area.

WWTF's programs also promote interdisciplinary collaboration, fostering connections between different academic disciplines and between academia and industry. Its funding has helped enable the **establishment of impactful initiatives**, such as the Center for Precision Medicine[5], which not only attracted substantial EU funding but also created lasting infrastructure and research networks.

Overall, WWTF's strategic role extends beyond financial support, influencing the development of new research areas, strengthening inter-institutional networks, and contributing to the long-term evolution of Vienna's academic landscape.

WWTF as a Partner for the City of Vienna

The interviews with **representatives from the City of Vienna** highlight WWTF's fundamental role as a strategic partner in strengthening Vienna's research and innovation landscape. Regular exchanges between WWTF and the City ensure continuous dialogue, positioning WWTF as an important linking element that connects research institutions with policy and societal needs.

WWTF's **focus on scientific excellence and basic research** complements the City of Vienna's more application-oriented strategies. This means in the words of our interview partner connecting business and research providing mutual stimulation and creating feedback loops for a kind of *reality check*. This complementary approach **creates synergies**, enabling research to move from theoretical foundations to practical applications, supporting areas like the digital agenda and economic strategies. A **notable example is the development of Digital Humanism**, where WWTF has helped to **establish strong networks between academia, industry, and policy**, fostering interdisciplinary cooperation.

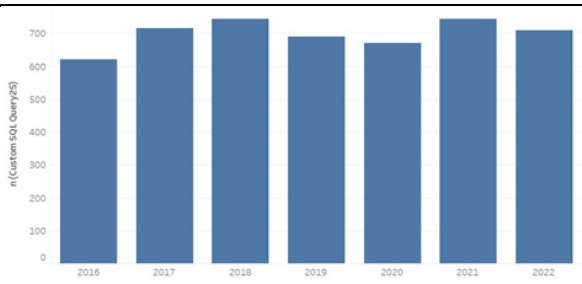
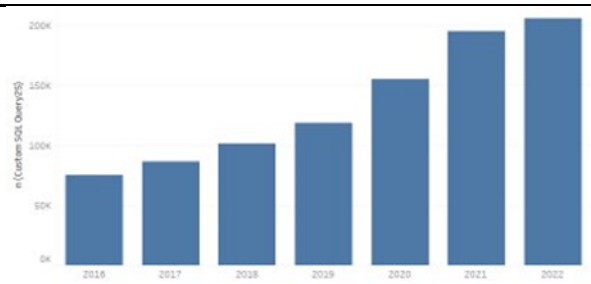
[5] https://www.meduniwien.ac.at/web/en/research/eric-kandel-institute-center-for-precision-medicine/

From the City's perspective, WWTF holds **strategic importance for Vienna's research and technology ecosystem**. Its ability to bring together key actors—both established and emerging—creates **platforms for knowledge exchange and innovation**. Furthermore, WWTF facilitates connections between academia and the business sector, **fostering feedback loops** that ensure **research remains relevant to real-world challenges**. Its strong focus on interdisciplinary work aligns closely with the City of Vienna's strategic goals, making WWTF a valuable partner in shaping Vienna's research area.

4.2.3 WWTF in Advancing and Supporting New Topics and Approaches

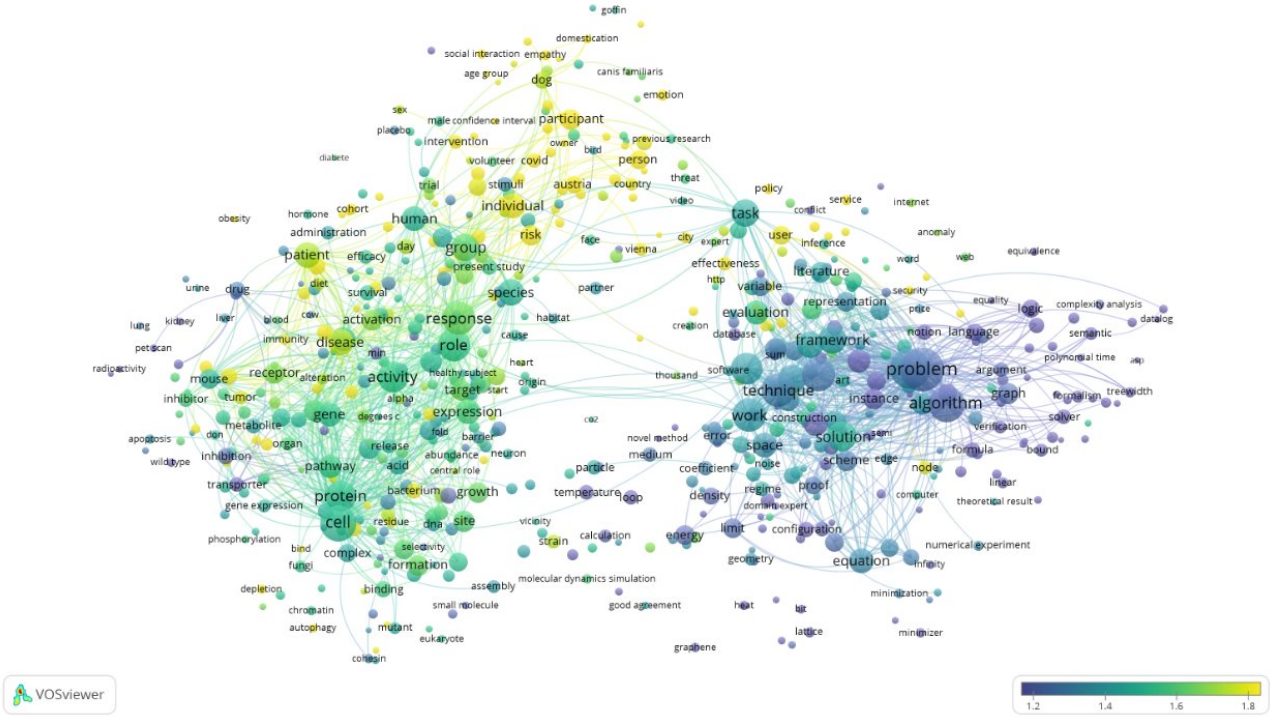
In this section we focus on bibliometric results related to emerging areas. These emerging areas are identified by looking at the evolution of areas in which WWTF has funded research. The evolution is characterized by the number of publications per year covering the recent past. Emerging areas are identified by a relatively large volume in the most recent 2 years as compared to a longer period of 10 years. The expected volume of the 2 most recent years is 2/10 = 0.2. If that is the case in a specific area the growth factor is 1. In an illustration we included an area in which the growth is around expected and one in which the growth is twice the expected. The second one would be identified as a fast-growing area.

Table 9: Areas of growth

	
Research area with a relative growth of 1.09	Research area with a relative growth of 2

The area evolution information is integrated in the term map describing the WWTF funded research at large. The map introduced in the data collection section was color-coded through the underlying publications and the growth information of the areas they belong to.

Figure 20: Key terms in titles and abstracts of publications representing research funded by WWTF, color-coded by relative growth of areas to which the publications belong.



In the term map (Figure 20), we discern very strong growth in cognitive sciences (top region of the map), strong growth in the biomedical region (left hand side) and stability (no growth) in mathematics and computer science (right hand side). This indicates that particularly in the cognition and biomedical and health research WWTF has contributed to the growing fields, indicating that there is a relation to emerging fields, but emerging fields usually don't emerge as such but rather emerge in existing areas, typically in those with a growing interest (output).

To identify more specifically the areas with the strongest growth and a substantial WWTF contribution, we selected areas in the publication level classification with at least 10 WWTF funded papers and a growth of at least 2. This selection yields the following areas:

Table 10: WWTF funded research with the strongest growth worldwide

Id	*Short label*	*Relative growth*	*P [full]*	*MNCS [full]*
2777	Empathy	2.25	22	2.46
431	Intrusion Detection	2.16	21	0.96
1013	Knowledge Graphs	2.27	14	1.14
40	Gut Microbiome	3.70	13	0.98
273	Epidemiological Modeling	3.32	12	2.52
82	Frailty and Sarcopenia	2.40	10	0.90

We found a diversity of areas: one area in cognitive sciences respective psychology (Empathy), three in mathematics and computer science (Intrusion detection, Knowledge graphs and Epidemiological modeling) and two in biomedical and health sciences (Gut microbiome and Frailty and Sarcopenia). A simple description of these areas is in Table 11. The fact that there are three in mathematics and computer science seems to contradict the results found in the term map, where particularly the computer science region showed stability rather than growth. In the description of areas (Table 11) we see traces of what we can call interdisciplinarity (e.g., neuroscience of empathy, impact of diet on health, modelling and public health intervention).

Table 11: Content summary of research areas Listed in Table 10

Empathy	The neuroscience of empathy, focusing on the neural mechanisms involved in affective responses, social cognition, and altruistic behaviour. It delves into topics such as empathy development, gender differences in empathy, the role of empathy in the physician-patient relationship, and the impact of emotion regulation on prosocial behaviour.
Intrusion detection	The application of machine learning and deep learning techniques for network intrusion detection, with a specific emphasis on cybersecurity, botnet detection, anomaly detection, DDoS attacks, and IoT security. The papers cover various methods, datasets, and approaches to improving the accuracy and efficiency of intrusion detection systems.
Knowledge graphs	Knowledge graphs, linked data, and semantic web technologies. It covers topics such as knowledge graph embedding, relation extraction, entity alignment, and question answering using graph neural networks. The papers also discuss the use of DBpedia and other multi-lingual knowledge bases for various applications in the domain.
Gut microbiome	The role of the gut microbiome in human health, focusing on topics such as gut microbiota composition, metagenomics, short-chain fatty acids, host-microbiota interactions, obesity, inflammatory bowel diseases, microbial ecology, immune system modulation, and the impact of diet on metabolic health.
Epidemiological modeling	Epidemiological modelling and mathematical analysis of infectious diseases transmission, with a specific emphasis on COVID-19. It covers topics such as reproduction numbers, asymptomatic transmission, public health interventions, disease dynamics, and the global spread of epidemics.
Frailty and Sarcopenia	Frailty and sarcopenia in older adults, exploring topics such as the definition, diagnosis, and consequences of these conditions. It also covers the impact on physical function, muscle mass, fall risk, inflammation, and mobility limitations, providing insights into health outcomes for older individuals.

Results from the survey provide evidence that highlights the crucial role of WWTF in advancing and supporting the emergence and development of new topics and approaches (including methods). Figure 10 (in Chapter 4.1.1) reveals the **high level of agreement among funding beneficiaries** regarding the ability of WWT **in promoting innovativeness (99%, n=210),** and the **development of critical mass and key research fields (93%).** Both elements underscore WWTF's strategic focus on enabling impactful and innovative research that strengthens Vienna's scientific ecosystem.

Furthermore, achievements of WWTF-funded projects further demonstrate the success in fostering the creation of new knowledge and the development of innovative methods and approaches. Survey respondents emphasized the **creation of new knowledge** (ranked first) as the most significant outcome, reflecting WWTF's commitment to fostering originality in research. Additionally, the **development of innovative methods and approaches** highlights WWTF's ability to encourage

projects that push methodological boundaries and explore novel avenues. The production of **high-impact publications**, another notable achievement, underscores the contribution of WWTF-funded initiatives to scientific discourse and their visibility in the global research community (see Figure 13 in 4.1.2.).

Another aspect that fosters the emergence of new fields through WWTF funding, as observed in our analysis, is the way WWTF sets specific thematic priorities while deliberately leaving the key concepts and terms within these themes broadly defined. This approach allows for flexibility and interpretation, which, combined with innovative funding formats, encourages researchers to step outside their comfort zones. As a result, actors who may not have initially viewed themselves as relevant to a particular topic are now engaging with it. This openness to diverse perspectives fosters interdisciplinary collaboration and helps **create emerging research fields that may not have been anticipated within more narrowly defined boundaries**. Thus, the calls are seen as stimulating impulses, encouraging researchers to consider how they might contribute to evolving interdisciplinary fields.

For example, in the case of precision medicine, WWTF's broad approach encouraged researchers to **expand their thinking beyond traditional applications** like oncology. As one participant noted:

> *"Yes, I believe that the WWTF, by keeping the call very open back then, definitely contributed to broadening our thinking. Honestly, the first impulse for many when it comes to precision medicine is oncology. However, the WWTF never restricted it, and this certainly led to engaging and activating people who might not have initially seen themselves fitting under the umbrella of precision medicine." (Quote from the Interview on Precision Medicine)*

4.2.4 Synthesis

Strengthening the Vienna research area is **recognized as a primary goal** of WWTF by actors within the Vienna research community. Through continuous communication, WWTF **identifies gaps, promising elements**, and needs, and helps **build a critical mass** with its innovative funding formats. This is confirmed by 93% of respondents.

WWTF embodies **partnership**, which is always conceived as **mutually effective**, both with the City of Vienna and the universities. It is a highly valued partner, especially because it is genuinely interested in understanding how institutions function, enabling it to provide targeted funding and activities. At the same time, the WWTF recognizes that **universities and research institutions** must **contribute to supporting and further developing emerging fields**. From this impactful network, structures emerge, such as the Center for Precision Medicine at the Medical University of Vienna. The City of Vienna benefits from and supports these initiatives alike.

WWTF **advances and supports new topics** and approaches, which are not necessarily new but whose **potential and relevance to Vienna the WWTF recognizes**. By maintaining openness in thematic focus while simultaneously challenging researchers to step outside their comfort zones through interdisciplinary and innovative funding formats, awareness of a field is created among actors who can then align themselves with it. This process leads to publications in new fields

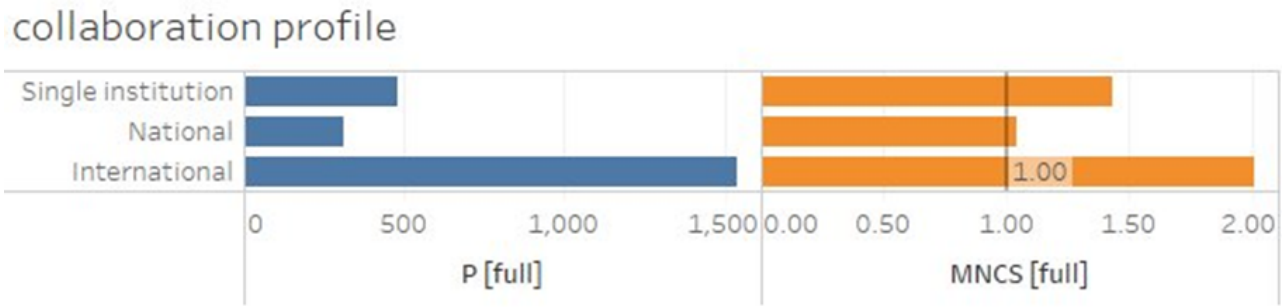
4.3 Contribution of WWTF to Collaborations and Interdisciplinarity

WWTF's mission to embed and support scientific projects is closely tied to fostering active networking and collaboration between disciplines and institutions. By promoting interdisciplinary research, WWTF aims to strengthen knowledge integration and enhance the impact of scientific work both within and beyond Vienna. This chapter presents the results of a bibliometric analysis, focusing on **(a)** collaboration patterns, as reflected in extramural co-authorship with a particular emphasis on international partnerships, and **(b)** interdisciplinarity as an indicator of knowledge integration. Beyond these quantitative insights, survey data provide qualitative perspectives on WWTF's role in facilitating interdisciplinary collaboration, knowledge transfer, and community-building activities. These findings are further enriched by in-depth interviews, offering a comprehensive assessment of how WWTF-funded initiatives contribute to fostering interdisciplinary and collaborative research.

4.3.1 Contribution of WWTF to Interdisciplinarity

Within the bibliometric analysis, we looked at the collaboration profile, in which the output of research funded by WWTF is characterized by the type of collaborations and the scientific impact these different types have. This profile shows the key role of research involving **international collaboration**, not only in volume (more than 1,500 publications) but also in impact (MNCS is twice the world average). The second type of collaboration output and impact is intramural. National collaboration takes the smallest part and has an impact around the world average.

Figure 21: Output and impact by collaboration type of WWTF funded research publications

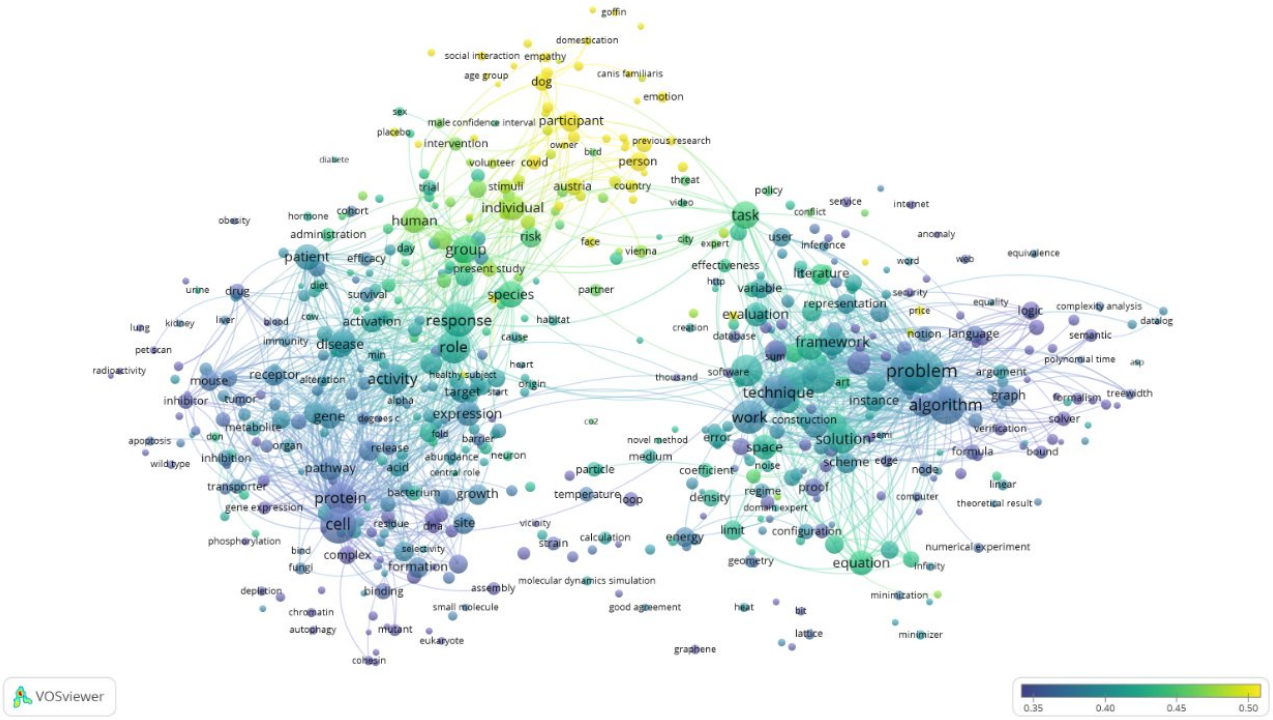


Data: CWTS WoS database version 2413

In addition, we looked at a different type of collaboration, related to the content. The use of different research fields (represented by the origin of cited references) is a way to determine knowledge base diversity, which relates to content-based collaboration. This can be considered as a special perspective on interdisciplinarity. We implemented the knowledge base diversity at the level of the areas to which WWTF publications belong. This is reflected by the ABC [kb div], the Area based knowledge base diversity. The database average (all sciences) is 0.4, which means that areas with a value above 0.4 means a high diversity. Such areas make use of more diverse knowledge (other fields) than the average area. The overall KB diversity of WWTF funded research publications is at world average (0.4), with national collaboration output slightly more diverse (0.42).

The KB diversity of the areas to which WWTF funded publications belong is used to integrate KB diversity into the term map, reflecting the content of WWTF funded research. The distribution over the term map is in Figure 22.

Figure 22: Term map of WWTF funded research color-coded by area-based Knowledge base diversity.



Source: CWTS WoS database version 2413

The map in Figure 22 clearly shows the higher diversity in the region of cognitive sciences (top region), with some elevated diversity on the interfaces with biomedical as well as with computer sciences.

If we select the areas in which diversity is substantially above average (>= 0.6, which means 50% above the world average), we identify the following areas with at least 9 WWTF funded publications.

Table 12: WWTF research areas with a high Knowledge base diversity

Id	label	P [full]	MNCS [full]	Relative growth	Kbdiv
3131	Aesthetic Curiosity	12	2.23	1.91	0.65
273	Epidemiological Modelling	12	2.52	3.32	0.63
1435	Evolution of Cooperation	9	1.02	1.34	0.66

These areas can be described as follows:

Table 13: Content summary of WWTF research areas with a high knowledge base diversity

Aesthetic Curiosity	Explores the intersection of aesthetic pleasure, curiosity, and cognitive processing, investigating the neural correlates of beauty, emotional responses to art, and the influence of perceptual pleasure on art perception. It delves into the fields of neuroaesthetics and examines how curiosity influences visual preference and aesthetic emotions.
Epidemiological Modelling	Focuses on epidemiological modelling and mathematical analysis of infectious diseases transmission, with a specific emphasis on COVID-19. It covers topics such

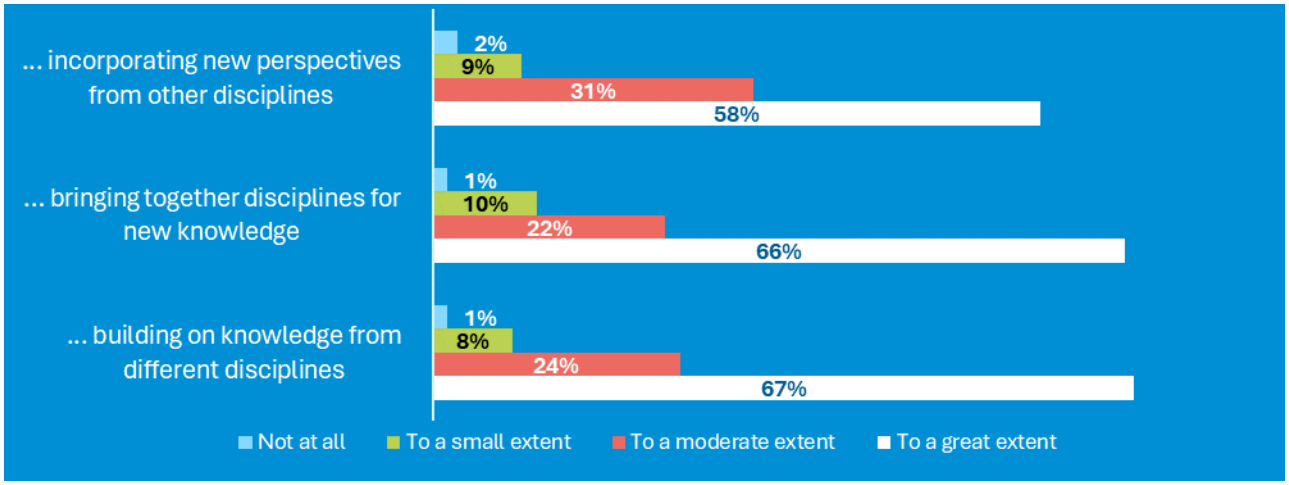
	as reproduction numbers, asymptomatic transmission, public health interventions, disease dynamics, and the global spread of epidemics.
Evolution of Cooperation	Explores the evolution of cooperation, altruism, and social behaviours in various contexts such as evolutionary games, social networks, and public goods games. It investigates mechanisms like indirect reciprocity, group selection, and cultural evolution to understand the emergence and stability of cooperative behaviours in different populations.

All these **areas are on the interface between social sciences and mathematics & computer sciences**. They all show significant growth and a **scientific impact (MNCS) from well above world average** up to more than twice the world average. In addition, they **show a significant growth**.

Qualitative results from the **focus groups and interviews highlight WWTF's pivotal role in fostering genuine interdisciplinary research**, a **feature that distinguishes it from other initiatives**. While many programs formally require interdisciplinarity, WWTF's displays unique funding structures that actively promote interdisciplinarity as a **core practice rather than a procedural formality**. By designing funding calls that inherently encourage collaboration across disciplines, WWTF ensures that interdisciplinarity is embedded throughout the research process. This commitment is reinforced through inclusive peer review processes and the facilitation of partnerships between relevant actors. For instance, regarding precision medicine, WWTF funding facilitates collaborations between clinicians, basic researchers, and in-house collaborators. As noted by representatives of university management, such interdisciplinary collaborations **not only introduce innovative approaches to universities** but also **drive impactful advancements across fields**. University representatives also highlighted the unique **high-level of interdisciplinarity in WWTF projects** compared against projects funded by other sources.

Furthermore, **survey findings validate WWTF's success in supporting interdisciplinary research**. A strong majority of beneficiaries emphasized the incorporation of new perspectives from other disciplines, with 98% agreement rate. Additionally, 98% of beneficiaries acknowledged that WWTF-funded projects bring together disciplines to create new knowledge, while 99% highlighted how these projects successfully build on knowledge from diverse fields. These results showcase the depth of interdisciplinary integration achieved through WWTF funding.

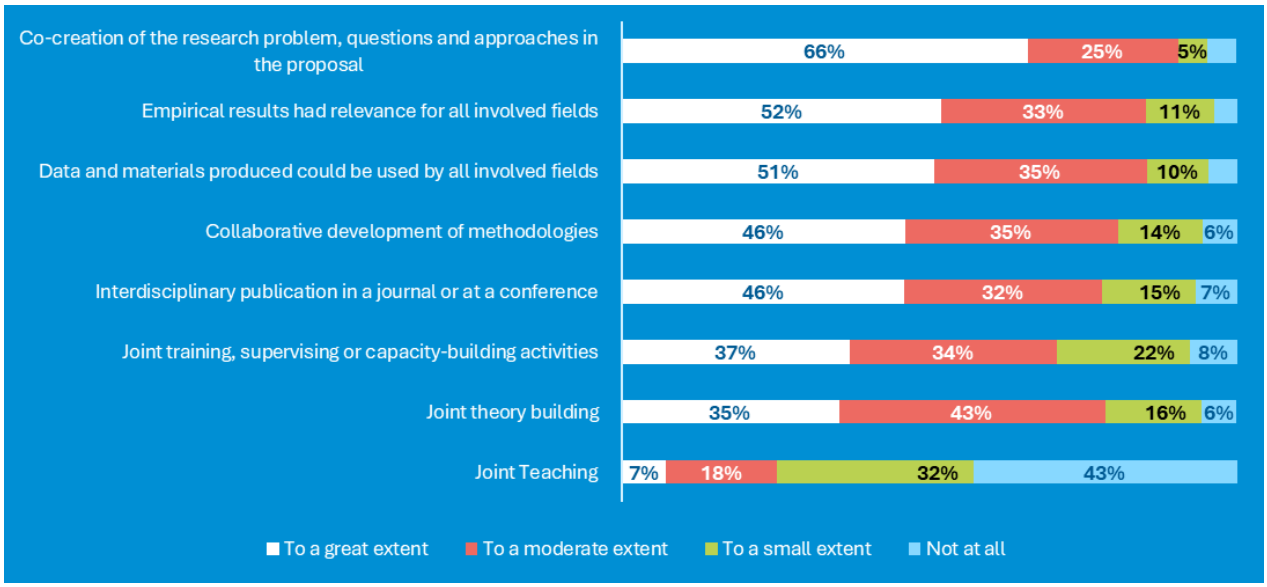
Figure 23: Interdisciplinarity of funded projects



Question 11. To what extent is your WWTF funded project ...
Data: Survey 2024, launched within the evaluation of WWTF
n=211

Further areas of the survey collected the **perceived degree of interdisciplinarity of funded projects.** The **ratio of the level of interdisciplinarity across projects is of 7.6 (on a scale from 1 to 10)**. The results show a clear trend towards high interdisciplinarity, with the **majority of respondents assigning their projects degrees of 9 (39 responses) or 10 (53 responses)** (see Figure 41 in the Appendix). Further elements of interdisciplinarity were surveyed revealing strong collaborations across different activities. Notably, co-creation of research problems, questions, and approaches emerged as a significant area of collaboration, **underscoring the depth of interdisciplinary engagement** in the initial stages of research and projects' design. Other key areas include the collaborative production of empirical results for all involved fields, and the shared use of data and materials across disciplines. Collaborative development of methodologies and interdisciplinary publications also demonstrated strong engagement. Aspects of interdisciplinary collaboration that seem less prominent involve joint activities around training, capacity-building, theory building and teaching.

Figure 24: Academic cooperation across fields of funded projects



Question 13. To what extent has academic cooperation across fields occurred in your WWTF-funded project?
Data: Survey 2024, launched within the evaluation of WWTF
n=210

Overall, the findings underline WWTF's significant contribution to advancing interdisciplinarity in Vienna's research landscape. By enabling projects that bring together diverse perspectives, foster new knowledge creation, and integrate expertise across disciplines, WWTF has established itself as a **catalyst for meaningful interdisciplinary collaboration and innovation**.

4.3.2 Limitations for Interdisciplinarity

Collected evidence also includes present limitations for the performance of interdisciplinarity. One of the **major constraints** stems from **current university policies**, which are influenced by **profile-building mandates**, such as those introduced by the **UG 2002 university reform**. [6]These mandates

[6] The **Universitätsgesetz 2002 (UG 2002)**, or **Universities Act 2002**, is an Austrian federal law that restructured the country's university system. It replaced previous legislation, including the University Organization Act of 1993 and the University Studies Act, to provide a comprehensive legal framework for the organization and study regulations of public universities in Austria. The act grants universities full legal capacity, allowing them to act as independent legal entities under public law. See Also: https://www.uibk.ac.at/index/finanzabteilung/ug2002_englisch.pdf

Figure 25: WWTF's support towards building academic networks and the sustainability of these

often restrict the flexibility needed to pursue common interdisciplinary initiatives, as universities are forced to develop individual profiles as their USP.

Additionally, there is a noticeable **lack of federal financial support for collaborative projects**, which further hinders the development of interdisciplinary approaches.

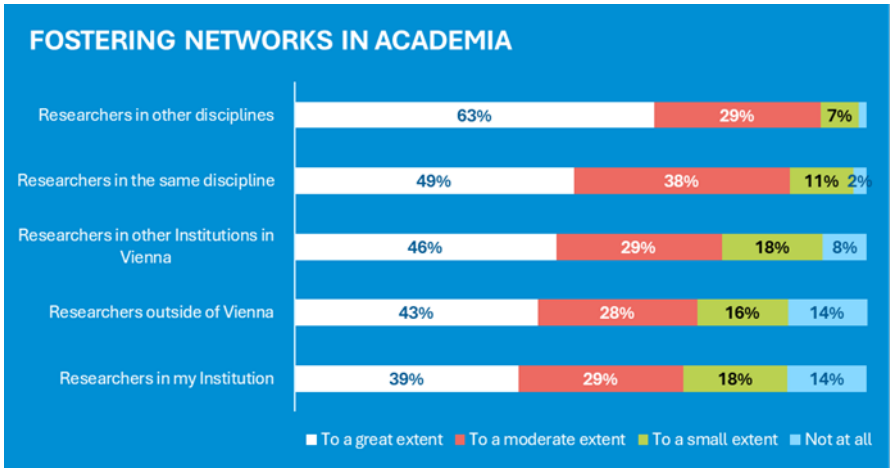
While WWTF plays a crucial role as an impulse generator and provides exemplary practices, its capacity to **drive and sustain broad structural changes within universities toward interdisciplinary directions remains limited**, partially due to the influence of ministries and other systemic barriers.

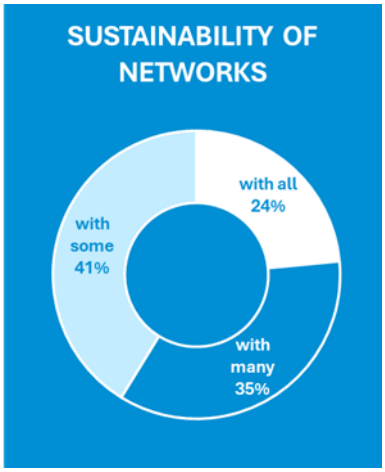
Another challenge lies in the **complexity of joint publications across disciplines**, where differing publication standards and specialized databases create obstacles for researchers. Access to academic resources also presents a barrier, as many universities have restricted access to libraries and databases to align with their institutional profiles, limiting researchers' ability to explore diverse disciplines. Furthermore, researchers often need to **establish themselves within their own disciplines before interdisciplinary approaches are accepted**, creating an additional layer of difficulty for those aiming to collaborate across fields.

These challenges underline the structural and systemic barriers that must be addressed to unlock the full potential of interdisciplinary research.

4.3.3 Contribution of WWTF to Collaborations

As presented in 4.2.1, WWTF has established itself as a pivotal element for fostering connections, taking the role of bridge-builder between different institutions and fields. This role enhances interdisciplinary and interinstitutional networks among its beneficiaries. Survey results show **most respondents highlighting the positive influence of WWTF funding in expanding their academic networks**. Notably, WWTF's funding is strongly contributing to the implementation and development of collaborations across disciplines and institutions both within and outside Vienna. However, the sustainability of academic networks presents mixed outcomes (35% maintained collaborations with "many" researchers, 41% with "some," and only 24% with "all" collaborators) indicating room for improvement in long-term network maintenance. [7]



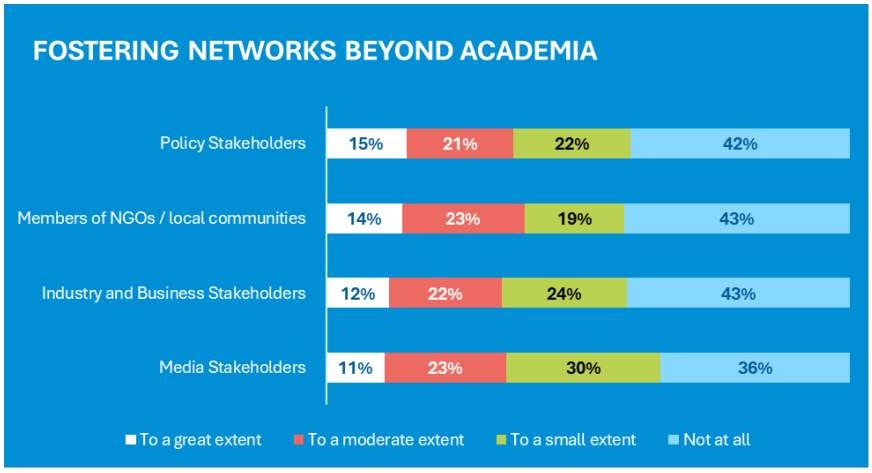


[7] Note: The survey results for this category "Sustainability of Networks" are based on a limited number of responses and should therefore be interpreted with caution. The findings may not fully represent the broader population of WWTF funding beneficiaries. This applies for Figure 25 and Figure 26.

Data: Survey 2024, launched within the evaluation of WWTF

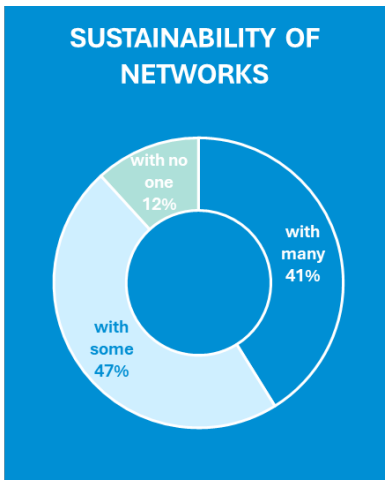
There are notably **less to no contributions towards the establishment of collaborations and networks beyond academia** (see Figure 26). Nevertheless, beneficiaries noted **WWTF's contribution towards the collaboration with policy stakeholders, NGOs, industry and media**. Yet, the sustainability of these networks appears to be higher highlighting the stability of such collaborations and the likelihood of lasting contribution through WWTF.

Figure 26: WWTF's support towards building networks beyond academia and the sustainability of these.



14.To what extent has the WWTF funding helped you expand your research network? Through the funding, I was able to connect with...

n= 209



15.Were you able to maintain the created research network after the end of the funding?

n= 19

Data: Survey 2024, launched within the evaluation of WWTF

4.3.4 Synthesis

Collected quantitative results (bibliometric data) point out WWTF's **scientific output as being characterised by interdisciplinarity, thus a high diversity level** (regarding knowledge base diversity at the level of publication areas). Particularly, high diversity is observed in the areas of cognitive sciences, biomedical and computer sciences. These areas also **show a positive growth and scientific impact above world average**. Qualitative data further underscores the genuine strategy of WWTF in funding and supporting interdisciplinarity, through **designing and implementing unique funding structures and actively embedding interdisciplinary work**. Moreover, funding beneficiaries have pointed out the strong support of WWTF towards the advancement of knowledge across different disciplines, the **incorporation of new perspectives and the collaboration between different disciplines** and institutions. Although collaboration occurs throughout projects, certain areas stand out for their **strong interdisciplinary impact**. These include **co-creation of research proposals, joint development of empirical results, and the sharing of data and materials across institutions**, all of which foster deeper collaboration and knowledge exchange. Overall, the findings underline WWTF's significant contribution to advancing interdisciplinarity in Vienna's research landscape. **However, contextual limitations are also present** including constraints from existing university policies, lack of federal financial support, as well as differing publication standards across academic institutions which hinder interdisciplinary initiatives. Nevertheless, WWTF also recognizes **its important role as facilitator** in this regard and shows notable efforts in favor of the creation of collaborations within and

beyond academia. It also **encourages the sustainability of created networks** through the continuous promotion of different events and networking opportunities, where WWTF facilitates the formation and maintenance of collaborations.

4.4 Impact Stories of WWTF

In this chapter, we examine the "Stories of Impact" presented by WWTF in its Self-Assessment Report (SAR). These stories illustrate how WWTF contributes to the Vienna research area beyond direct funding, through activities such as strategic interventions, community building, and thematic initiatives. WWTF describes their role as follows:

> *"In this context, the impact stories should help to display our efforts to contribute to the Vienna research area also through structural interventions, ranging from strategy work to community building, and thematic signals. Thus, the impact stories describe larger areas where we assume that our work has had effects on the scientific, societal, and policy environment, also beyond funding." (WWTF SAR, p. 45)*

The Stories of Impact highlight WWTF's efforts to make **contributions beyond funding** visible by showcasing the cumulative effects across different thematic areas. They provide concrete examples of WWTF's activities, such as (co-)organizing events, fostering interdisciplinary collaboration, and contributing to policy strategies. As outlined in Chapters 4.1.1 and 4.2 , **our data confirm this beyond funding engagement of WWTF** in the Vienna research area. This was repeatedly emphasized by our interviewees, who described WWTF as "always on board," reflecting its strong and consistent presence and strategic interactions. This chapter delves deeper into these findings, focusing on WWTF's strategic contributions in specific thematic areas.

Since the Stories of Impact are thoroughly documented in the SAR, our goal is not to verify each event or activity. WWTF acknowledges that these **stories represent their own perspective**, without fully knowing whether others in the Vienna research area share this view or whether blind spots exist. **Our role, therefore, was to contrast WWTF's perspective,** which we did with insights from interviews conducted with experts in the respective thematic areas. Rather than analyzing the overall developments, **we specifically examined WWTF's contribution to these impacts**. This serves as a form of "reality check" for WWTF's self-assessment.

To strengthen this analysis, we sought evidence that either supports or challenges the claimed impacts. We interviewed key individuals with a comprehensive view of their fields, enabling them to assess WWTF's role and influence objectively. **In addition to qualitative interviews, we conducted bibliometric analyses** to identify quantitative indicators related to the Stories of Impact. The methodology for this analysis is described below.

Research areas that showed a high/substantial total number of publications, high citation rates or area-based connectedness (MNCS, PP cited in policy, ABC policy), high growth, or interdisciplinarity (RSD) were looked at from the specific perspective of each respective impact story. Also, the share of all Viennese publications was regarded. To identify relevant content of research areas, their names and keywords were taken into account. Their relevance for each impact story was identified through desk research and expert judgement. With this methodology several examples were collected to support consistent narratives.

4.4.1 Stories of Impact – reality check – Digital Humanism

Summary of the "Story of Impact" from the Self-Assessment Report

According to the SAR, the Story of Impact "Digital Humanism" encompasses the following: The **Digital Humanism** initiative, introduced by WWTF, aimed to bring together the ICT community in Vienna and translate a philosophical debate into a concrete program encompassing research, education, and industry. It began with a proposal presented to the professors and Scientific Advisory Board at TU Wien in 2018, leading to an international workshop in 2019. The resulting **Vienna Manifesto on Digital Humanism** called for a human-centered, inclusive approach to digital technologies, bridging ICT and social sciences. WWTF's funding efforts in this area began with a call for projects in early 2020, leading to the funding of nine projects, and expanded to include calls for **Digital Humanism Roadmaps** in 2022, a subsequent call in ICT with focus on Digital Humanism in 2023, and a **Doctoral College** to support interdisciplinary collaboration between ICT and SSH researchers. The initiative has had significant academic and societal impact, with a growing number of publications, projects, and policy initiatives adopting the principles of Digital Humanism. WWTF's work has been instrumental in creating a platform for long-term research collaborations and shaping digital policies regionally and nationally (WWTF SAR; p. 47-50).

Role of WWTF according to our interview partners

Digital Humanism, as highlighted by all our interviewees and focus-group participants, is a success story with significant impact on the Vienna research area. From the City of Vienna's perspective, Digital Humanism is **strategically important,** contributing, e.g., to the City's approach to digitalization. The planned conference in May 2025 is mentioned as contribution to Vienna's visibility.

Our interlocutors emphasize **WWTF's role as a driving force** for Digital Humanism. WWTF took the initiative and actively engaged with partners from various universities to establish Digital Humanism in Vienna. It represents an emerging field that has thrived due to WWTF's **strategic and ongoing communication with key stakeholders**. Its groundwork includes a study commissioned by the City of Vienna on Digital Humanism and its contribution to the "Vienna Manifesto on Digital Humanism", as well as the launch of its funding program for Digital Humanism in 2020.

WWTF is recognized as a central entity driving Digital Humanism, **organizing key networking events that promote interdisciplinary exchange**. One notable example is the successful networking event at the Hofburg, attended by 75 Principal Investigators (PIs), which was seen as a major success. This event demonstrated WWTF's ability to connect institutions and disciplines across boundaries. WWTF is also acknowledged for its role in **enabling Digital Humanism within the research community, with a clear focus on interdisciplinary collaboration**, such as through the Digital Humanism Calls.

WWTF's support for interdisciplinary projects and events has strengthened collaboration among institutions, raising the visibility of Digital Humanism and fostering a positive perception across sectors, including companies and start-ups. Despite limited infrastructure and few IT startups in Vienna, the initiative has broad participation. The initiative has also become a brand, attracting businesses, start-ups, and other stakeholders, creating clear connection points for these actors to engage with, thus **increasing visibility and relevance**.

Thanks to WWTF and its collaboration with actors in the Vienna research area Digital Humanism acts as a model for interdisciplinarity, bringing together actors from various fields. It has also fostered

sustainable structures like the Digital Humanism Doctoral College, ensuring long-term growth and collaboration.

4.4.2 Stories of Impact – Reality Check - Smart City & Environmental System

Summary of the "Story of Impact" from the Self-Assessment Report

The **Story of Impact** highlights WWTF's role as a change agent in advancing Smart City and environmental system research in Vienna. Acting as a connector within the research ecosystem, WWTF facilitated collaboration between universities, research institutions, and external stakeholders, which has led to significant advancements in climate and environmental action. In the early 2010s, recognizing the need for more integrated and strategic action in the face of climate change, WWTF worked closely with the Vienna Public Utilities and the City of Vienna to initiate a transformation process. This culminated in the development of the **Smart City Framework Strategy**, focusing on carbon reduction, innovation, and social equity. WWTF's strategic involvement in shaping this framework, along with its funding programs supporting interdisciplinary research, has played a key role in fostering systemic change across the city's environmental and energy sectors. Through its guidance, WWTF helped Vienna Public Utilities strengthen its internal and external research and innovation capacities, leading to long-term initiatives like the "Future Fund" that promote research, technology, innovation, and climate protection in a coordinated and measurable manner. This ongoing influence has resulted in policy initiatives, such as the "Raus aus Gas" campaign, that push Vienna towards more sustainable, integrated environmental solutions.

Role of WWTF according to our interview partners and bibliometric insights

According to our interview partner from the City of Vienna the Smart City Framework Strategy is a crucial and long-term strategy for the City of Vienna, serving as the overarching framework for transforming the city into a sustainable and climate-friendly urban environment. The interview partner confirms that WWTF played a significant role in co-initiating this strategy, contributing its expertise and fostering connections among key stakeholders.

The contact person from the City of Vienna specifically highlights **WWTF's capacity to break down barriers and facilitate collaboration** between different sections through **strategic and persistent networking and communication efforts** with different actors within the City. This helped shape the Smart City Framework Strategy into a holistic and inclusive approach.

The strategy benefitted from a **comprehensive consideration of all relevant aspects affecting the city**. Knowledge transfer and integration of expertise ensured that important issues were addressed, enhancing the strategy's broader impact on urban development.

By **involving all relevant stakeholders early in the process**, including during the development of indicators, the strategy **gained strong acceptance and commitment from those involved**. Despite intense discussions and disagreements surrounding CO_2 reduction and economic growth, solutions were developed that balanced both objectives, showcasing the strategy's ability to reconcile conflicting interests.

A key factor in the **strategy's success was its focus on understanding stakeholder needs and fostering connections among different actors**, ensuring that the strategy remained practical and focused on achieving tangible, targeted outcomes which was initiated by WWTF from the beginning.

An **analysis of bibliometric data reveals strong specialization in various smart city-related topics** across the EU Missions framework. All subtopics under the Cities Mission exhibit a high level of specialization, indicated by a Revealed Comparative Advantage (RCA) greater than 1. The highest specialization levels are found in:

- Circular Economy
- Urban Planning
- Urban Governance for Transition
- Digitalization & Smart Solutions

Additionally, strong specialization (RCA > 1) is also observed in the areas of:

- Mobility and Transport
- Energy Transition

These insights highlight key focus areas where EU cities are leading in research and innovation, supporting strategic priorities within the EU's urban development agenda.

4.4.3 Stories of Impact – Reality Check - Precision Medicine

Summary of the "Story of Impact" from the Self-Assessment Report

The Story of Impact for Precision Medicine highlights WWTF's efforts to position Vienna as a global leader in this transformative field of medical research. Launched in 2015, WWTF's initiative to introduce precision medicine within its Life Sciences program aimed to strengthen Vienna's role as a major life sciences hub by bringing together local expertise and infrastructure, while increasing international visibility. Technological breakthroughs in the early 2010s made precision medicine feasible, and WWTF's funding calls in this area helped to unite researchers across disciplines, encouraging collaborations between universities and research institutions. As a result, WWTF's precision medicine calls supported cutting-edge research, leading to major breakthroughs such as improved cancer treatments, the identification of genetic matches for organ transplants, and the founding of a successful spin-off company, Allcyte. The initiative not only advanced scientific knowledge but also fostered collaboration within the local ecosystem and enhanced Vienna's position in the global precision medicine landscape.

Role of WWTF according to our interview partners and bibliometric insights

WWTF has played a pivotal role in advancing precision medicine in Vienna, contributing significantly to both research and clinical applications. Vienna holds a unique position with an exceptional combination of resources, creating an environment where precision medicine can thrive and achieve international recognition. **WWTF's strategic funding** has led to groundbreaking clinical studies, resulting in remarkable success stories where patients have achieved remission through innovative therapies. These outcomes illustrate the **effective translation of excellent basic research into tangible clinical benefits**, showcasing Vienna's potential to become a global leader in this field.

One of the most striking impacts of WWTF-supported projects is the **direct benefit to patients**. The linear connection between basic research and clinical application is rarely as clear as it is in **Vienna's precision medicine initiatives, where new therapies quickly reach clinical trials** and, ultimately, patient care. WWTF's broad and inclusive approach has fostered advancements not only in oncology, where precision medicine is most developed, but also in cardiology, nephrology, and neurology. This

wide-ranging perspective has led to improved diagnostics and more targeted, effective therapies across various medical disciplines.

WWTF has also been **instrumental in driving technological innovation**. Its funding acts as a catalyst, enabling the acquisition of advanced, often expensive, technologies that might otherwise be inaccessible. This support has helped **integrate cutting-edge tools into both research and clinical environments**, facilitating rapid progress and fostering a dynamic scientific ecosystem. Collaboration is another cornerstone of WWTF's impact. Projects frequently involve partnerships between clinicians and basic researchers, as well as key academic institutions like the Medical University of Vienna, the University of Vienna, and BOKU University. These collaborations have created a vibrant network that strengthens Vienna's research landscape.

Furthermore, WWTF's strategic investments **have significantly enhanced Vienna's international visibility**. A feature in *Nature* placed Vienna alongside leading global hubs such as Boston, underscoring **the city's competitive edge in precision medicine**. The establishment of the Eric Kandel Center for Precision Medicine, supported by €60 million in EU funding and strong backing from the City of Vienna, exemplifies the successful synergy between local government, international funding bodies, and WWTF. This new infrastructure not only provides state-of-the-art facilities for research but also reflects Vienna's long-term commitment to scientific excellence. This is a perfect example of the mutual effective partnership of WWTF and Vienna research institutions.

Vienna has reached a critical mass in precision medicine, with sustained momentum driven by a comprehensive strategy that integrates both prevention and targeted therapies. **WWTF's flexible, forward-looking funding approach** ensures that Vienna **remains at the forefront of medical innovation**, continuously adapting to new developments in technology and research. In this evolving landscape, WWTF's role extends beyond financial support; it acts as a strategic driver of collaboration, technological advancement, and clinical impact, solidifying Vienna's status as a leader in precision medicine on the global stage.

The bibliometric analysis highlights the significant impact of precision medicine in key fields such as **oncology, genomics, immune therapies, and neuroscience**. Highly cited studies demonstrate breakthroughs in personalized approaches, including **cancer immunotherapy, epigenetic modifications, and regenerative medicine**. Other critical areas include **metabolic diseases**, **infectious diseases (e.g., COVID-19, sepsis)**, and **precision technologies** like organs-on-chips.

The **multidisciplinary nature** of WWTF-funded research is evident in these results, showcasing its role in advancing innovative and impactful solutions in precision medicine.

4.4.4 Stories of Impact – Reality Check – Data Advocacy

Summary of the "Story of Impact" from the Self-Assessment Report

WWTF's impact in data advocacy extends across all its funding priorities, focusing on promoting data quality, accessibility, and the integration of quantitative methods in research. Since its inception, WWTF has supported quantitative approaches through initiatives like bioinformatics chairs (2004) and quantitative life sciences (2008). Recognizing Austria's limitations in public data access, WWTF played a key role in advocating for legal reforms post-GDPR (2018), co-founding the *Plattform Registerforschung* to improve registry data access. Their efforts contributed to the establishment of the Austrian Microdata Center (AMDC) in 2022, enhancing microdata availability for research. During the COVID-19 pandemic, WWTF swiftly launched a Rapid Response Call to support critical data collection,

demonstrating its agility in crisis situations. Additionally, WWTF engaged in strategic alliances like the *Future Operations Platform* to inform policy decisions with evidence-based insights, culminating in contributions to Austria's national data strategy.

Role of WWTF according to our interview partners and bibliometric insights

According to our interview partner, **access to register data** has **long been a priority for researchers in Austria**, particularly the ability to link data. However, concerns were raised by political stakeholders. The COVID-19 pandemic triggered a shift in perspective, highlighting the critical importance of access to nationwide data, especially register data. This change in mindset was pivotal for the further development of the strategy and was **significantly influenced by WWTF**.

As a driver of strategic progress, WWTF **fostered collaboration** among stakeholders through initiatives such as the **"Plattform Register Forschung".**

Proactive agenda-setting and interventions enhanced the visibility of the topic, leveraging platforms like X/Twitter and opinion pieces in journals and newspapers.

Targeted funding provided the necessary support for initial projects, paving the way for larger-scale funding initiatives.

WWTF's early engagement and flexibility allowed it to fund initial projects, which served as a **foundation for subsequent, more expansive initiatives**. Through strategic communication, WWTF encouraged cooperation among ministries to integrate data, demonstrating its capacity to bridge gaps between research and policy.

Recognized as a valuable partner, WWTF's contributions have been crucial for the overall strategy, cementing its role as an important facilitator of data advocacy in Austria.

Our bibliometric analysis shows that in the Data Advocacy Program there **was only one WWTF call in 2022**, therefore **publications with respective impacts will be expected in the future**. However, high-growth research areas with **high impacts in relation to the Covid-Calls were identified** as relevant here, e.g., the data-driven area of Epidemiological Modeling.

Epidemiological modeling, a rapidly growing field, accounts for 12 publications (12% of Vienna's publications) and is characterized by high citation rates, significant growth, and political relevance.

4.4.5 Stories of Impact – Reality Check – Vienna Research Groups

Summary of the "Story of Impact" from the Self-Assessment Report

The VRG program, launched by WWTF in 2010, aims to attract outstanding early-career researchers from abroad to Vienna, offering them substantial funding and the opportunity to establish independent research groups. The program has played a dual role: driving structural change by promoting the implementation of tenure track systems at Viennese universities and strengthening Vienna's research landscape through the recruitment of top international talent. Its success is reflected in the high career advancement rates of VRG leaders, with many achieving Associate or Full Professorships. An external evaluation in 2021 confirmed the program's significant impact on research excellence, career development, and the modernization of academic career models in Vienna.

Role of WWTF according to our interview partners and bibliometric insights

According to our interview partners and focus group participants (among them not only members of the Vienna research area but also a VRG leader) the VRG program has established itself as a highly competitive and internationally recognized initiative.

From the perspective of VRG group leaders, the program offers long-term career opportunities that are rarely available elsewhere. The combination of long-term funding and tenure-track positions **enables researchers to focus deeply on their scientific work while bringing innovative ideas into their host institutions.** Additionally, the open calls by WWTF **allow for the recruitment of top talent, including postdocs and PhD candidates,** without rigid thematic restrictions. This flexibility promotes scientific exchange across disciplines and facilitates network-building on overlapping research questions.

Researchers benefit from early and exceptional recognition, both financially and institutionally, which helps them confidently establish themselves within Vienna and their host institutions. The presence of a strong promoter at the host university further supports their integration and success.

From an institutional perspective, the **VRG program is highly valued for its contribution to organizational development.** Institutions particularly appreciate the unique funding model, which accelerates the arrival and impact of talented researchers.

It is worth noting that the VRG program has already been the subject of an evaluation. For further details, we encourage you to review the comprehensive evaluation report, which provides additional insights into the program's impact and effectiveness.

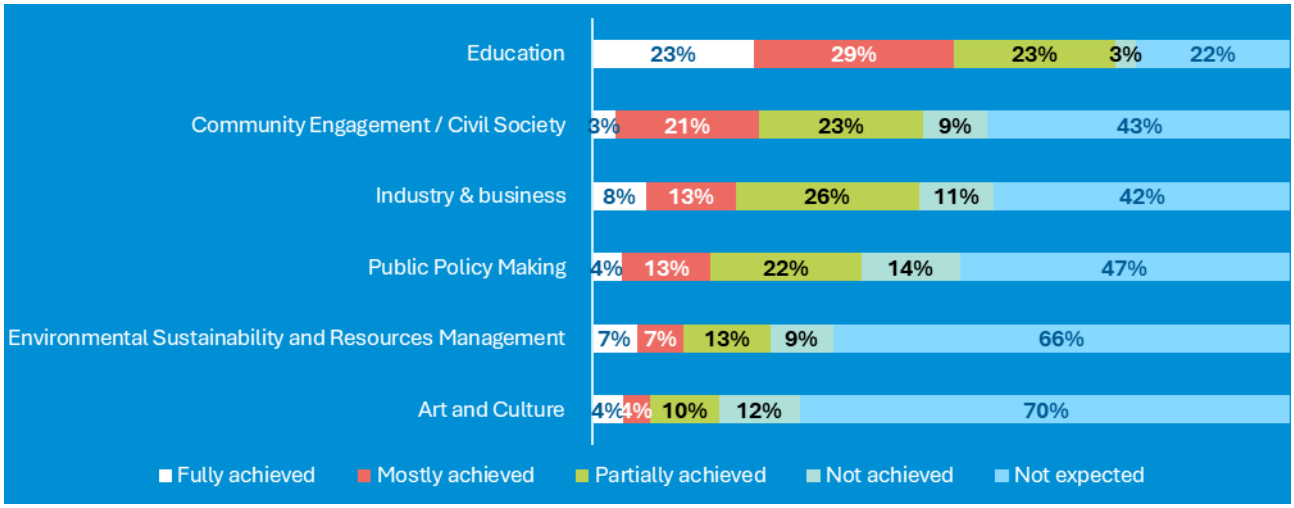
4.4.6 Additional Success Story

In analyzing our data, we identified an additional success story within the funding activities of WWTF: the **COVID Rapid Response Call**. This call was perceived extremely positively, praised for the swift and flexible handling with minimal bureaucratic hurdles. It **enabled a rapid response to urgent pandemic-related challenges**, creating occasion-based opportunities for basic research that might have been difficult to implement otherwise. **WWTF played a critical role during the COVID-19 pandemic by launching this call quickly**, demonstrating the strategic importance of agile funding mechanisms. The establishment of the Future Operations Board during the pandemic further highlights WWTF's capacity to respond effectively to emerging developments, a model that holds potential for future challenges beyond the context of COVID-19.

4.4.7 Impact of funding – Areas of impact on the project level

Survey results collected the **achieved and expected impact of funded projects across different areas,** like education, industry, environmental sustainability, and so on. Results show a high percentage of not expected impact in almost all areas except for education, which presents the highest achieved impact, with 75% of beneficiaries reporting the achievement of impact through their funded projects (fully, mostly, and partially achieved added together) (see Figure 27). This is followed by community and civil society, with beneficiaries actively contributing to policy regulation, participating in public events, and raising awareness on societal issues such as sustainability and public health. Collaboration with industry and business stakeholders has fostered innovation, technology transfer, and the development of new tools and prototypes. Environmental sustainability is another key area, with funded projects focusing on sustainable practices, resource management, and environmental decision-making. However, some areas, such as art and culture, show relatively lower levels of reported impact.

Figure 27: Impact of funded projects



Q 20. In which areas beyond science has your WWTF-funded project achieved or is expected to achieve impact?
Data: Survey 2024, launched within the evaluation of WWTF
n= 204

Figure 28: Summarized results of Q 21. Please describe your achieved impacts for the selected areas beyond science in the question above (Q 20).

1. **Policy and Public Sector Engagement**
    1. Contributions to public policy and regulatory debates (e.g., digitalisation, migration policies, health policies).
    2. Engagement with policymakers, public institutions, and regulatory bodies.
2. **Education and Training**
    1. Contributions to the development of new teaching courses and integration of research findings into education.
    2. Support for student education through funded positions and training opportunities (e.g., PhD, Master's).
3. **Community Engagement and Civil Society**
    1. Participation in public events, panels, and exhibitions.
    2. Awareness-raising on societal issues (e.g., diseases, sustainability).
4. **Industry and Business Collaboration**
    1. Partnerships with industry for technology transfer and development.
    2. Contributions to innovation through methods, tools, and prototypes.
5. **Environmental Sustainability and Innovation**
    1. Focus on sustainable practices and resources management.
    2. Contributions to environmental decision-making and sustainability.

Q 20. In which areas beyond science has your WWTF-funded project achieved or is expected to achieve impact?
Data: Survey 2024, launched within the evaluation of WWTF
n= 204

The **high percentage of "not expected" impacts across most areas can be attributed to WWTF's primary focus on funding excellent basic research**. Additionally, the significant number of projects still ongoing at the time of the survey (see Figure 38 in the Appendix) should be considered, as many impacts may only materialize after project completion. Nevertheless, evidence of **impact can already be observed** across WWTF's thematic programs, **reflected in long-term collaborations, interdisciplinary advancements, and the generation of knowledge** that **supports education and capacity-building.**

Public policymaking stands out as an area of notable impact, particularly in the realm of digitalization. Impacts in this area include the development and implementation of strategic

frameworks such as the AI Strategy, the Digital Agenda Wien, and various policy toolkits.[8] These achievements underline WWTF's unique ability to bridge research excellence with practical, city-focused transformations that extend beyond academia. WWTF has been paving its way to achieving impact beyond science in this area by establishing and nurturing long-standing partnerships with the City of Vienna, with a particular focus on supporting transformative initiatives since 2010.

4.4.8 More emphasis on societal Challenges?

The consolidated data from interviews and focus groups reveal that many stakeholders perceive **WWTF as already addressing societal challenges inherently through its focus on basic research**. Rather than viewing societal impact as an external goal, participants emphasized that WWTF's **thematic priorities and interdisciplinary approach naturally foster contributions to societal issues**. This intrinsic link between basic research and societal relevance is seen as a defining feature of WWTF's funding strategy.

Several voices highlighted that the very nature of WWTF's **support for high-quality, curiosity-driven research creates the conditions for meaningful societal outcomes**—without the need to explicitly steer projects toward predefined societal goals. The flexibility, openness, and interdisciplinary collaboration embedded in WWTF-funded projects are viewed as key drivers that allow societal impact to emerge organically.

At the same time, there are differing opinions on whether WWTF should strengthen its focus on societal challenges. **Some argue that maintaining an open, excellence-driven approach is critical**, as societal benefits often arise unexpectedly from fundamental discoveries. Others suggest that while WWTF should not shift its focus away from basic research, it could enhance how it captures, measures, and communicates the societal impacts already being generated.

Overall, the data suggest that WWTF's impact on societal challenges **is not an additional layer but an inherent outcome of its funding model**—rooted in the belief that excellent basic research is, by its very nature, a catalyst for societal progress.

4.5 EU Mission orientation in the research of WWTF

We present the context, approach, and results of task 2.5 "EU Mission orientation in the research of WWTF" supporting evidence for other evaluation questions, i.e., addressing the question on societal challenges in WWTF's research funding by contributing insights into the alignment of WWTF-funded research with European Missions[9], and by identifying and comparing WWTF-funded and EU mission-oriented publications with Vienna research area publications in order to assess share and thematic focus of EU mission-oriented research output supported by WWTF funding.

[8] See also WWTF SAR (2024)

[9] In Horizon Europe, the legislators have introduced the concept of Missions as a new means of addressing major societal challenges. https://era.gv.at/horizon-europe/missions/

4.5.1 Approach

Our approach was first, to delimit the content of the EU Mission areas, their thematic areas and keywords as identified within the Austrian Baseline Study on European Missions[10]; second, to determine hit rates for scientific publications[11] in the WoS per European Mission and subject area funded by WWTF, or co-authored in Vienna, and Austria respectively on a time scale of 2020-2023; and third, to analyze and visualize the collected data.

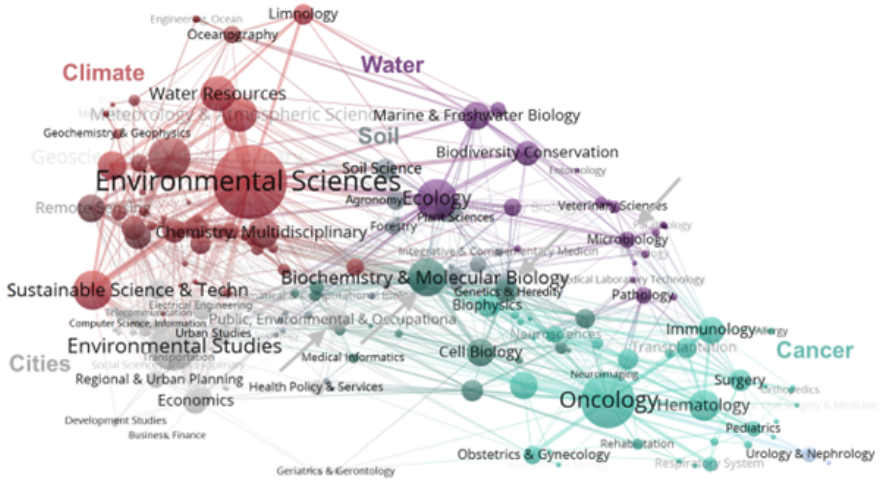
4.5.2 Context information on European Missions

For a better comparison and understanding of the results, we refer to and summarize context information from the Baseline Study on European Missions, which are:

- **Adaptation to Climate Change**: support at least 150 European regions and communities to become climate resilient by 2030
- **Cancer**: working with Europe's Beating Cancer Plan to improve the lives of more than 3 million people by 2030 through prevention, cure and solutions to live longer and better
- Restore our **Ocean and Waters** by 2030
- 100 Climate-Neutral and Smart **Cities** by 2030
- A **Soil** Deal for Europe: 100 living labs and lighthouses to lead the transition towards healthy soils by 2030

The Baseline Study on European Missions (2022) highlighted that the two most EU Mission-relevant scientific disciplines of WoS were identified as *oncology* and *environmental sciences*, followed by some other highly relevant disciplines, such as *geosciences multidisciplinary*, *biochemistry & molecular biology*, and *multidisciplinary sciences*.

Figure 29: Network of scientific disciplines from the Web of Science as presented in the Baseline Study on European Missions in Austria (2022)



[10] Ploder, M, Kasztler, A et al. (2022): Baseline Study on European Missions in Austria (2022); https://era.gv.at/public/documents/4722/Endbericht_Baseline_MoP1_v02_20220706.pdf

[11] No proceedings included

In the Figure 29, the network of scientific disciplines from the Web of Science as presented in the Baseline Study on European Missions in Austria (2022) is shown highlighting their interconnection and EU Mission-relevance; nodes: scientific disciplines, edges: common mention in publications.

Within this disciplinary consideration of the EU Mission-orientated research, Baseline Study authors found several important bridging disciplines in the centre of the network graphics (marked with grey arrows, from left to right), i.e., *public environmental occupational health, biochemistry & molecular biology, genetics, microbiology*.

From a broad perspective on the contents of the identified EU mission-oriented publications, the authors of the Baseline Study on European Missions (2022) found that 'health in all policy areas' was central to discussions across all five European Missions. The scientific discourse focused on key factors influencing health and quality of life, emphasizing a healthy environment, healthy (micro)organisms, and healthy cells, while also addressing the development, identification, and treatment of diseased cells. Also, climate change and its effects were visible as a dominant topic in environmental research. *Cancer Research* were found to emphasize the treatment of the disease in addition to research at the cellular level, and *Cell Research* were identified as an important EU mission-oriented bridging research area between cancer and environmental science.

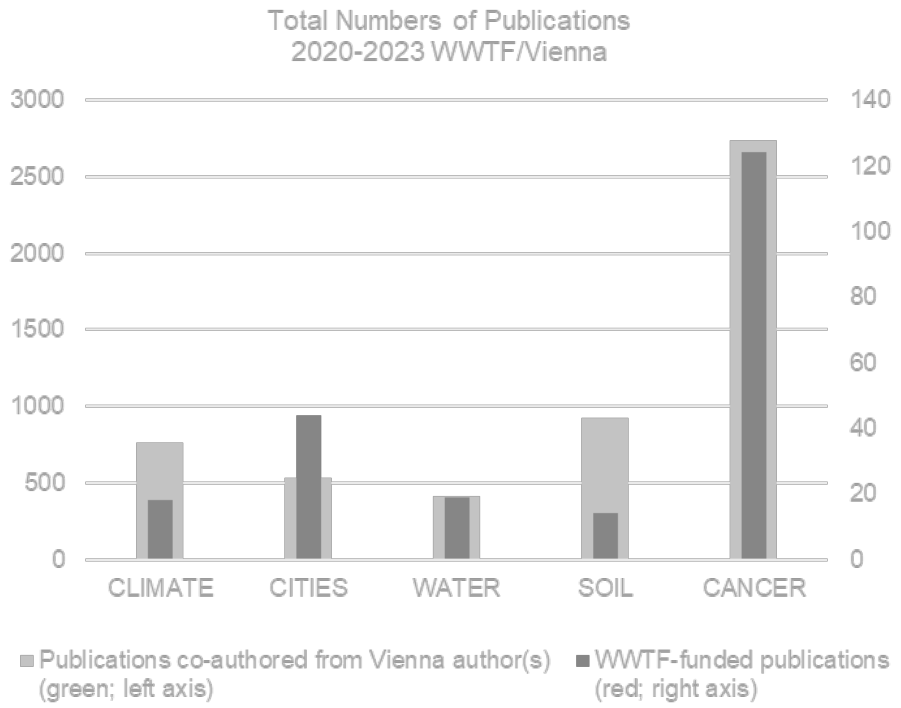
4.5.3 Database – Identified EU Mission-Relevant Scientific Publications

Analog to the approach of the Baseline Study on European Mission (2022), the following numbers of scientific publications authored from at least one Austrian, Viennese, or WWTF-funded author (2013-2023) were identified, retrieved from WoS and analyzed.

Table 14: Database: Identified EU Mission-relevant scientific publications, WoS (2013-2023, without proceedings)

	Web of Science	EU Missions	Mission Climate	Mission Cities	Mission Water	Mission Soil	Mission Cancer
Austria	259.536	30.082	5.288	2.885	2.465	4.043	17.410
Vienna	31.624	4.974	761	536	416	926	2.740
Vienna share of Austria	12%	17%	14%	19%	17%	23%	16%
WWTF-funded	2.244	210	18	44	19	14	124
WWTF share of Vienna	7%	4%	2%	8%	5%	2%	5%
WWTF share of Austria	0,86%	1%	0,34%	1,53%	0,77%	0,35%	0,71%

Figure 30: Database: Identified EU Mission-relevant scientific publications, WoS (2020-2023, without proceedings)



4.5.4 Results

EU Mission-relevant publications co-authored by at least one author from Vienna have a higher share (17%) of Austria than on average (12%). This means that from the total number of publications we see that Vienna authors show a higher focus on topics that are relevant to EU Missions than authors from Austria on average. Also, EU Mission-relevant WWTF-funded publications have a higher share (1%) of Austria than average (0,86%), which means that WWTF funds slightly more EU Mission-relevant publications than other topics. From this data we could assume that Vienna and also WWTF are more EU Mission-oriented than Austria as a whole.

Regarding the overall share of WWTF-funded publications compared to Vienna, WWTF-funded publications have a lower share of mission-oriented publications co-authored in Vienna (4%) than on average (7%). From this data we could conclude that Vienna publications have a higher EU Mission-orientation than WWTF-funded publications for all five EU Missions. However, WWTF-funded mission-oriented publications were identified in an above-average share of Vienna publications in the Cities (8%) Mission, pointing out a high involvement of WWTF in science relevant for the EU Cities Mission.

From the bibliometrics within this study we found that WWTF-funded publications are strongly involved in, e.g., health science, engineering, computer science, mathematics, earth science, humanity, and biological chemistry.

We regarded keywords and journal names (see previous chapters) to derive content information on WWTF-funded publications which we compared to the overarching content view on EU Missions. This has been earlier described as “health in all policy areas”, trying to influence health and quality of life in the form of a healthy environment with healthy (micro)organisms and healthy cells and the development, identification and treatment of diseased cells on the other side and their highly relevant topics climate change (and its effects within environmental research), cells research (as an important

bridging area), and cancer research (emphasizing the treatment of the disease in addition to research at the cellular level).

From this overall view on WWTF funded publications we derived the following assumptions for WWTF funded science:

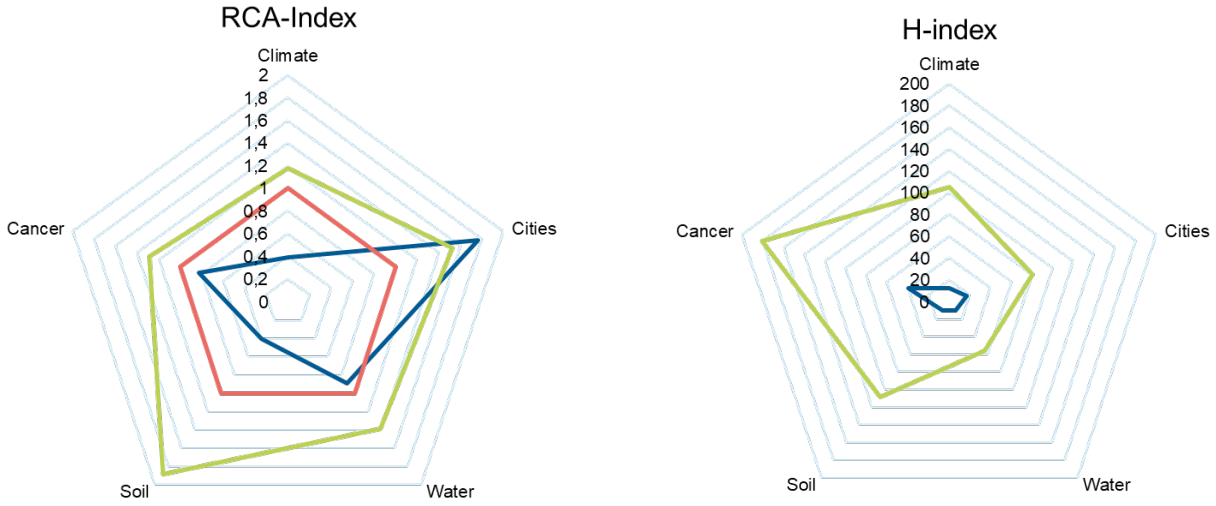
- WWTF-funded science was strongly found within the areas health, medicine and biology, which can be regarded at the center of EU Missions supporting "health in all policy areas".
- WWTF-funded science with inter-/transdisciplinary focus (Digital Humanism, ICT programs) can be seen in line with the digitalization topic across all EU Missions.
- WWTF's Environmental Systems Research program has potential to become an important mission-oriented research area.
- WWTF-funded cell and (micro)organisms research (Life Sciences program) is seen as an important bridging area within EU Missions.
- WWTF-funded medical research was identified highly relevant within Cancer Mission.

Figure 31: Summary: WWTF-funded science within a Mission-oriented context

- **Overarching view of EU Missions**
  - At the centre of the discussion on all five missions: Health and quality of life (health, quality, life) → 5 Missions => 1 Mission ("Health in all Policy Areas")
- **Scientific discourse within EU Missions**
  - Influencing health and quality of life in the form of a healthy environment with healthy (micro)organisms and healthy cells and the development, identification and treatment of diseased cells on the other side.
- **Highly relevant topics**
  - Climate change and its effects within environmental research
  - Cells research: important bridging topic
  - Cancer research: emphasises the treatment of the disease in addition to research at the cellular level

- **Overarching view: WWTF**
  - ➢ WWTF funded science around health, medicine and biology at the center of EU missions supports "Health in all Policy Areas"
- **Scientific discourse within WWTF-funded publications**
  - ➢ WWTF funded science with inter-/transdisciplinary focus (Digital Humanism, ICT programs) in line with digitalization as a cross topic within EU missions
- **WWTF within important EU Missions topics**
  - ➢ WWTF Environmental Systems Research program has potential to become an important mission-oriented research area
  - ➢ WWTF funded cell and (micro)organisms research (life sciences program) within an important bridging topic of EU missions
  - ➢ WWTF funded medical research was identified highly relevant within Cancer mission

Figure 32: EU mission-oriented WWTF funded/ Viennese publications:

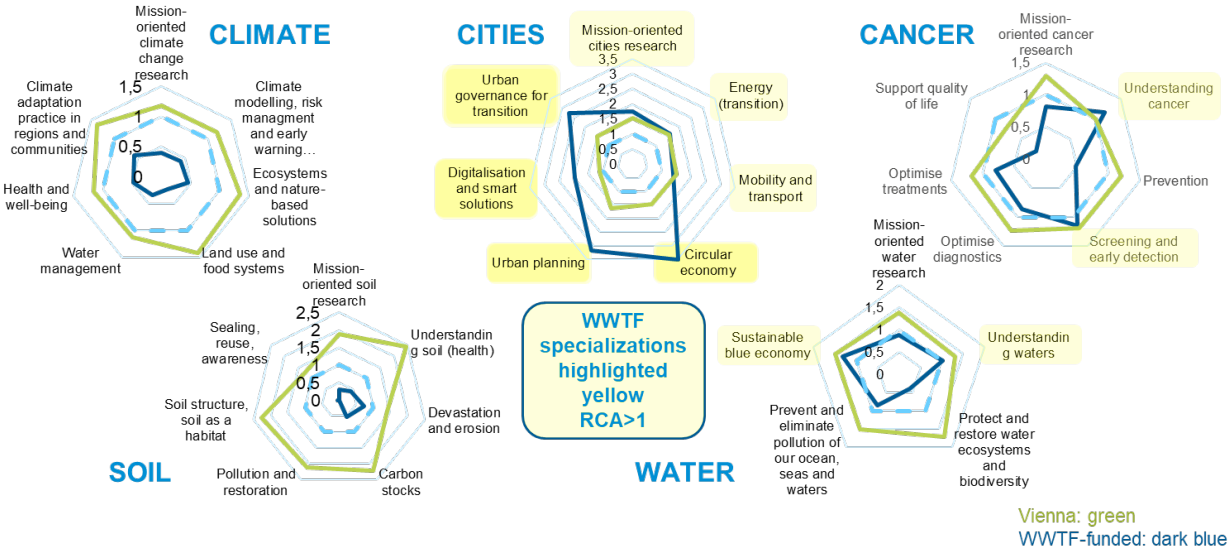


In Figure 32, mission-oriented publications funded by the WWTF (red) and by Vienna (green) are shown with WWTF specializations (RCA-index) with regard to Austria (left) and impact (H-index; right). The Revealed Competitive Advantage (RCA) indicates the share of WWTF or Vienna in a field in relation to the share of Austria in that field. The higher the RCA is above 1, the greater the specialization in a field in relation to Austria.

Mission-oriented WWTF-funded publications were found to have a high specialization within the Cities Mission, whereas Vienna showed specialization within all EU Missions, especially within the Soil Mission.

Regarding scientific impact of mission-oriented publications measured by the Hirsch index (H-index), highest values were found within Cancer research in Vienna and for WWTF-funded publications.

Figure 33: mission-oriented WWTF funded (red)/Viennese (green) publications: Specializations (RCA-index) within subareas for each of the five EU Missions Climate, Cities, Cancer, Soil, and Water. The RCA indicates the share of WWTF



High specializations of WWTF-funded publications (RCA>1) were found within all Cities Mission subareas, the highest values within

- Circular economy
- Urban planning
- Urban governance for transition
- Digitalization & smart solutions

Specializations within Cancer Mission subareas were found within

- Screening and early detection
- Understanding cancer

Specializations within Water Mission subareas were found within

- Sustainable blue economy
- Understanding water

Low specializations of WWTF-funded publications (RCA<1) were found within all subareas of the Soil Mission, while Vienna showed specializations especially regarding understanding soil, carbon stocks, pollution and restauration, soil structure, soil as habitat. This might be caused by the quite application-oriented character of this EU Mission but could also have other reasons. This might as well change in the future through the WWTF Environmental Systems Research program.

4.5.5 Conclusions on EU Mission-Relevance

From the analysis of total numbers, keywords, journal names, and specializations of WWTF-funded publications, several observations on EU mission-orientation emerged. WWTF-funded science is strongly concentrated in health, medicine, and biology, aligning closely with the EU Missions of

promoting "health in all policy areas." Inter- and transdisciplinary initiatives, such as those in Digital Humanism and ICT programs, resonate with the cross-cutting digitalization priorities of EU Missions.

The WWTF Environmental Systems Research program demonstrates potential to become a significant contributor to mission-oriented environmental research, while cell and (micro)organisms research in the Life Sciences program serves as an important bridge within various EU Missions. Notably, high specialization levels (with relation to Austria) were identified in all subareas of the Cities Mission, especially within circular economy, urban planning, urban governance for transition, and digitalization & smart solutions. Within the Water Mission, specializations were observed in sustainable blue economy and understanding water systems.

Additionally, WWTF-funded medical research shows high relevance to the Cancer Mission with high scientific impact (H-index) and identified specializations in the subareas screening and early detection, as well as understanding cancer.

5 FIGURES

6 TABLES

7 REFERENCES

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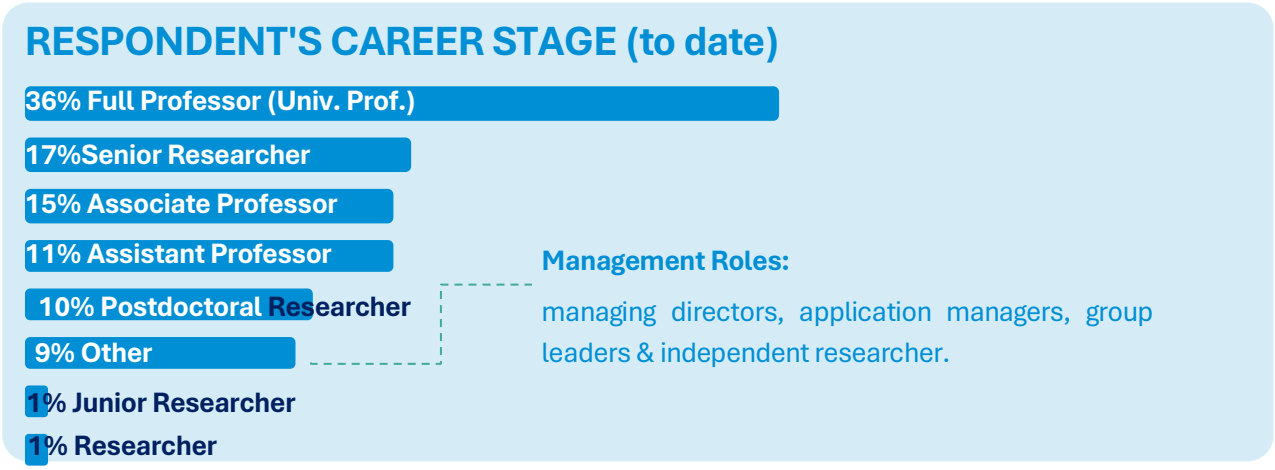
8 APPENDIX

8.1 Additional Survey Results

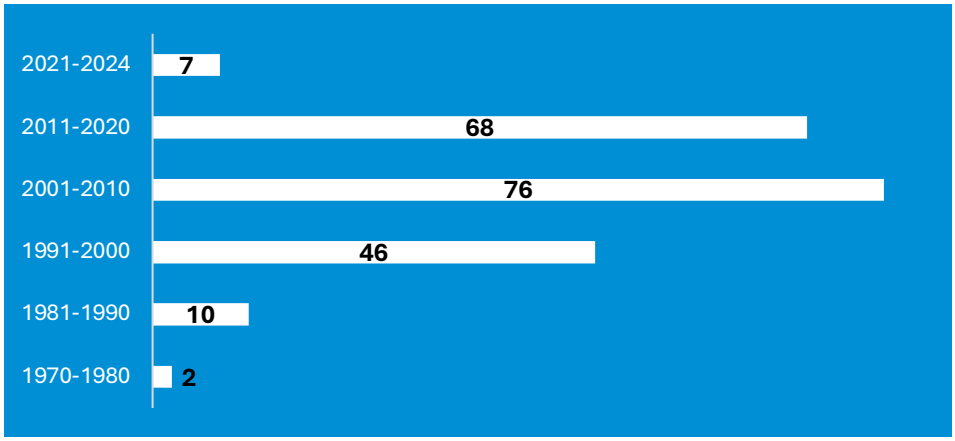
This section provides further results of the Survey method as support for the evaluation study.

Figure 34: Q 1. Please indicate your academic position or career stage for the given time:



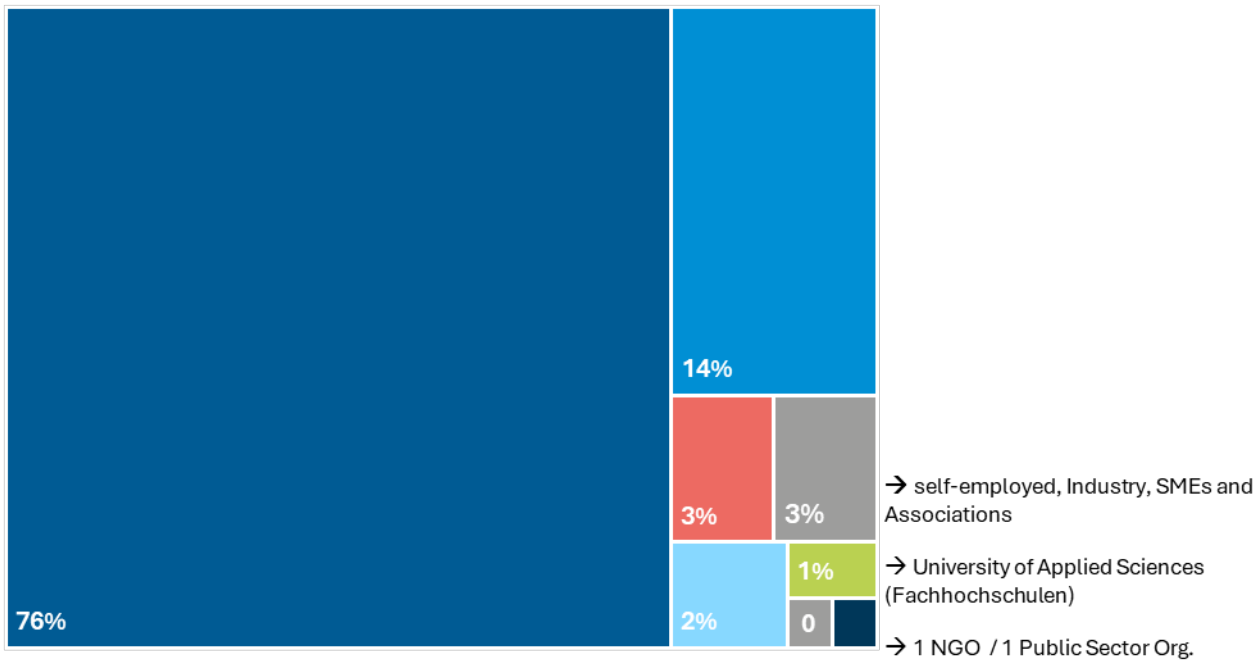
Data: Survey 2024, launched within the evaluation of WWTF
n= 222

Figure 35: Q 3. In which year did you obtain your PhD: (if applicable)



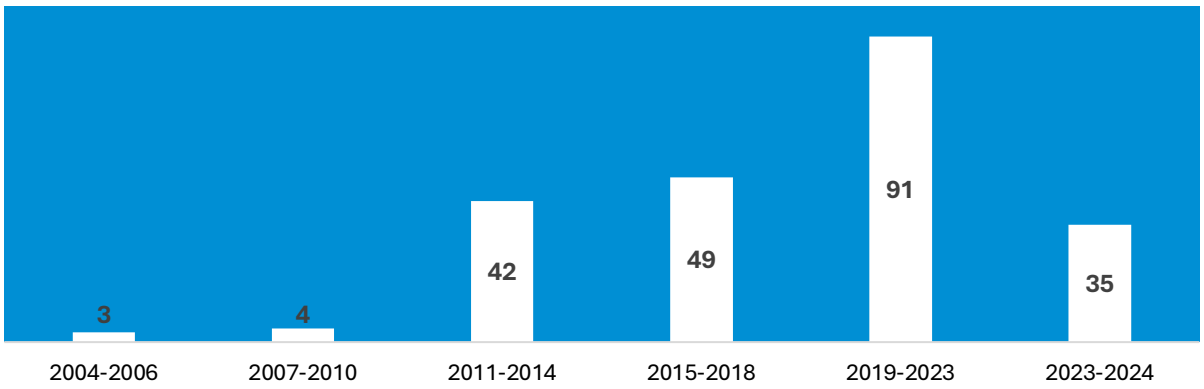
Data: Survey 2024, launched within the evaluation of WWTF
n= 209

Figure 36: Q 4. What type of organization do you represent?



* Research Institute (non-University) (mostly publicly financed)
** Research institute (non-University) (mostly privately financed)
Data: Survey 2024, launched within the evaluation of WWTF
n= 224

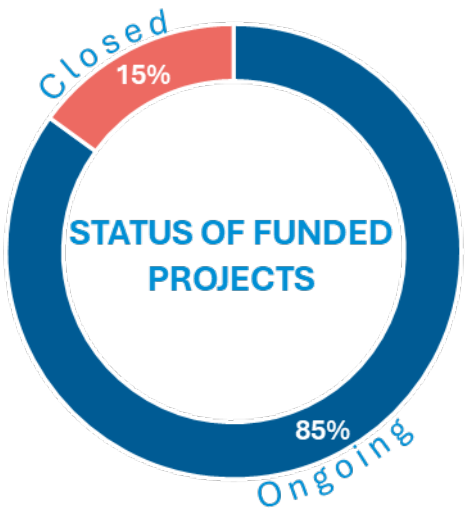
Figure 37: Q 6. Indicate the year in which you were awarded WWTF funding:



Data: Survey 2024, launched within the evaluation of WWTF
n= 224

Figure 7 and 8 present results regarding the status of funded projects. At the time of the survey, 48% of the projects reported were already completed, while 52% were still ongoing. This distinction directly affects the scope of achieved and anticipated impacts described by respondents.

Figure 38. Q 7. Is the funded project still ongoing?



7. Is the funded project still ongoing?:
n= 113

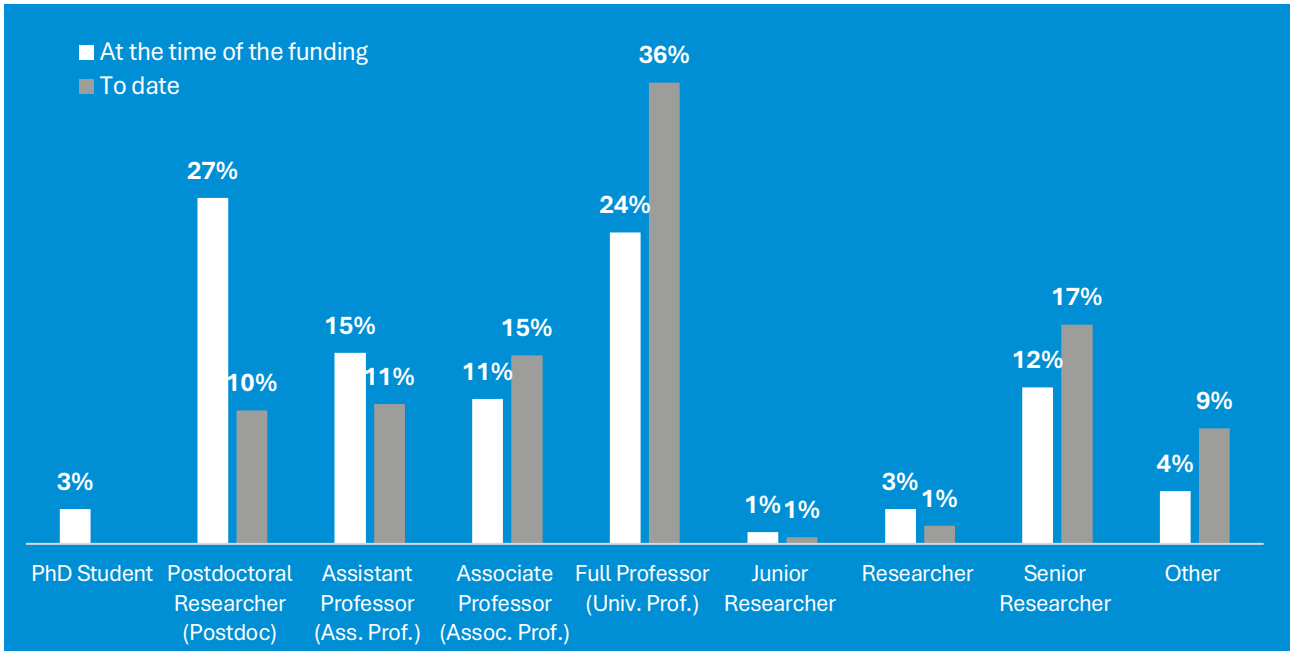
Data: Survey 2024, launched within the evaluation of WWTF
n= 224 (Total number of cases including years before 2020)

Career development:

At the time of funding, most respondents (27%) were Postdoctoral Researchers, while 24% were already Full Professors (see Figure 39). Assistant Professors and Associate Professors accounted for 15% and 11% respectively, with a smaller percentage of PhD students (3%), Researchers (3%), or Junior Researchers (1%).

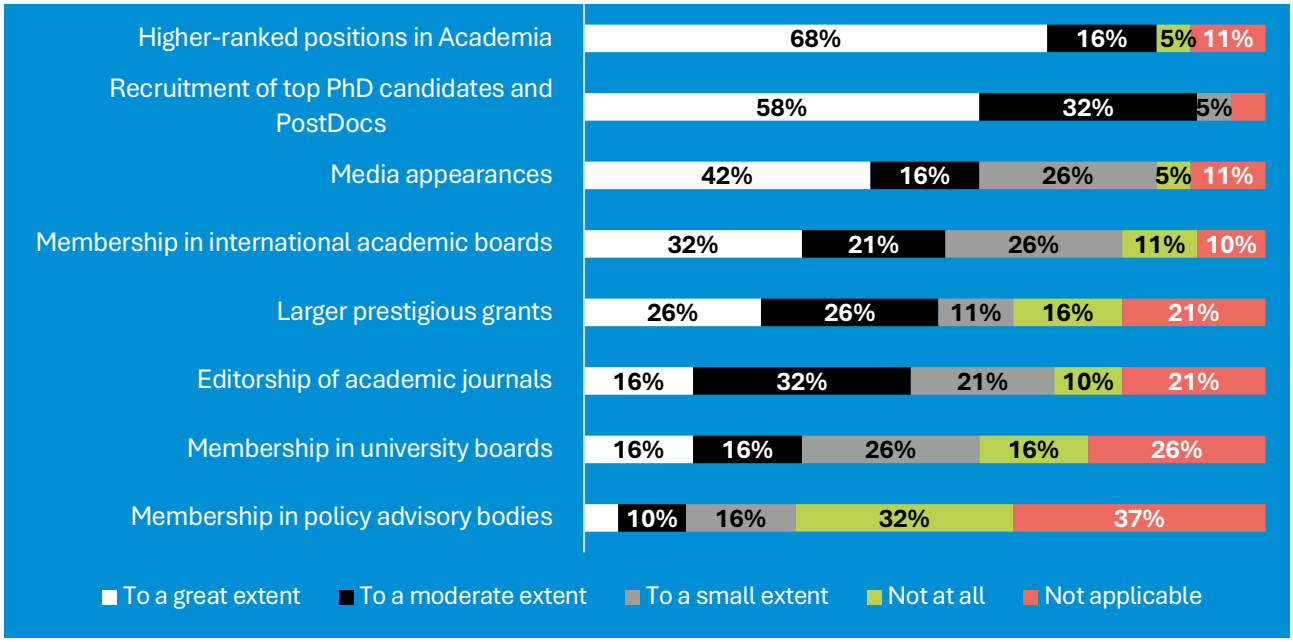
Over time, a significant increase is observed in the proportion of respondents achieving Full Professor status, rising from 24% to 36%, which suggests notable upward career mobility. Similarly, the percentage of Senior Researchers increased from 12% to 17%. Conversely, the share of Postdoctoral Researchers declined from 27% to 10%, reflecting career advancements. The proportions for Assistant Professors (11%) and Associate Professors (15%) remained relatively stable, suggesting moderate movement within these positions.

Figure 39: Q 1. Please indicate your academic position or career stage for the given time:



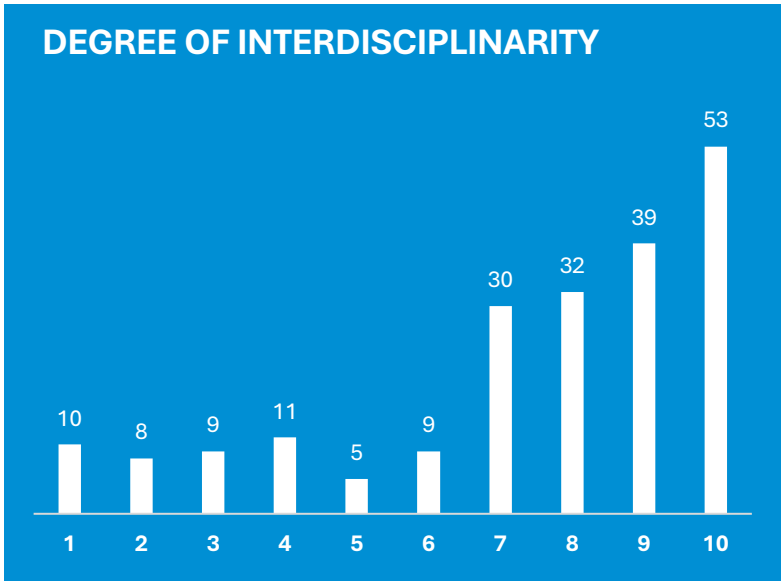
Data: Survey 2024, launched within the evaluation of WWTF
n= 222

Figure 40: Q 18. To what extent has the WWTF funding enabled you to advance your career? It helped to achieve/obtain... **Filtering only VRG grantees.



Data: Survey 2024, launched within the evaluation of WWTF
n= 19 (VRG Grantees)

Figure 41: Q 12. How would you describe the degree of interdisciplinarity in your WWTF-funded project?



Data: Survey 2024, launched within the evaluation of WWTF
n= 206

8.2 Survey questionnaire

1.Please indicate your academic position or career stage for the given time:

2.Please specify "other" career stage or academic position:

3.In which year did you obtain your PhD: (if applicable)

4.What type of organization do you represent?

5.Under which type of WWTF program have you received funding? (in case you have received funding from more than once, please select accordingly)

6.Indicate the year in which you were awarded WWTF funding:(indicate the starting year of your project; in case you have received funding more than once, consider the year of your largest funding grant; in case the funding volume was more or less equal between multiple funding grants, consider the most recent funding)*you don ´t remember the year of your funding?

7.Is the funded project still ongoing?

8.Which role did you fulfill in the funded project?

9.Please indicate your level of agreement with the following statements about WWTF:

10.To what extent did the following aspects influence your decision to apply for WWTF funding?

11.To what extent is your WWTF funded project ...

12.How would you describe the degree of interdisciplinarity in your WWTF-funded project?

13.To what extent has academic cooperation across fields occurred in your WWTF-funded project?

14.To what extent has the WWTF funding helped you expand your research network? Through the funding, I was able to connect with...

15.Were you able to maintain the created research network after the end of the funding?

16.To what extent has the WWTF funding helped you expand your network outside academia? Through the funding I was able to connect with...

17.Were you able to maintain the created network outside academia after the end of the funding?

18.To what extent has the WWTF funding enabled you to advance your career? It helped to achieve/obtain...

19.What do you consider to be the most significant achievements of your funded project? Please select at least three options and drag-and-drop them by level of importance, the first one you drag into the box on the right is the most significant. ** In case you are using a Smartphone: select the options below. Your order of selection gives automatically the ranking.

20.In which areas beyond science has your WWTF-funded project achieved or is expected to achieve impact?

21.Please describe your achieved impacts for the selected areas beyond science in the question above:

22.Assuming impacts beyond science are desirable, How could WWTF funding be structured to support the achievement of expected impacts?

23.Looking ahead, how do you envision the future development of WWTF activities? Please share your recommendations on potential directions or changes, e.g., the orientation towards societal impact and EU Missions, strengthening interdisciplinarity, emphasizing scientific quality and excellence, and supporting high-risk research. What kind of funding instruments would be needed for your recommendations?

24. Gender

Notes

Notes

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