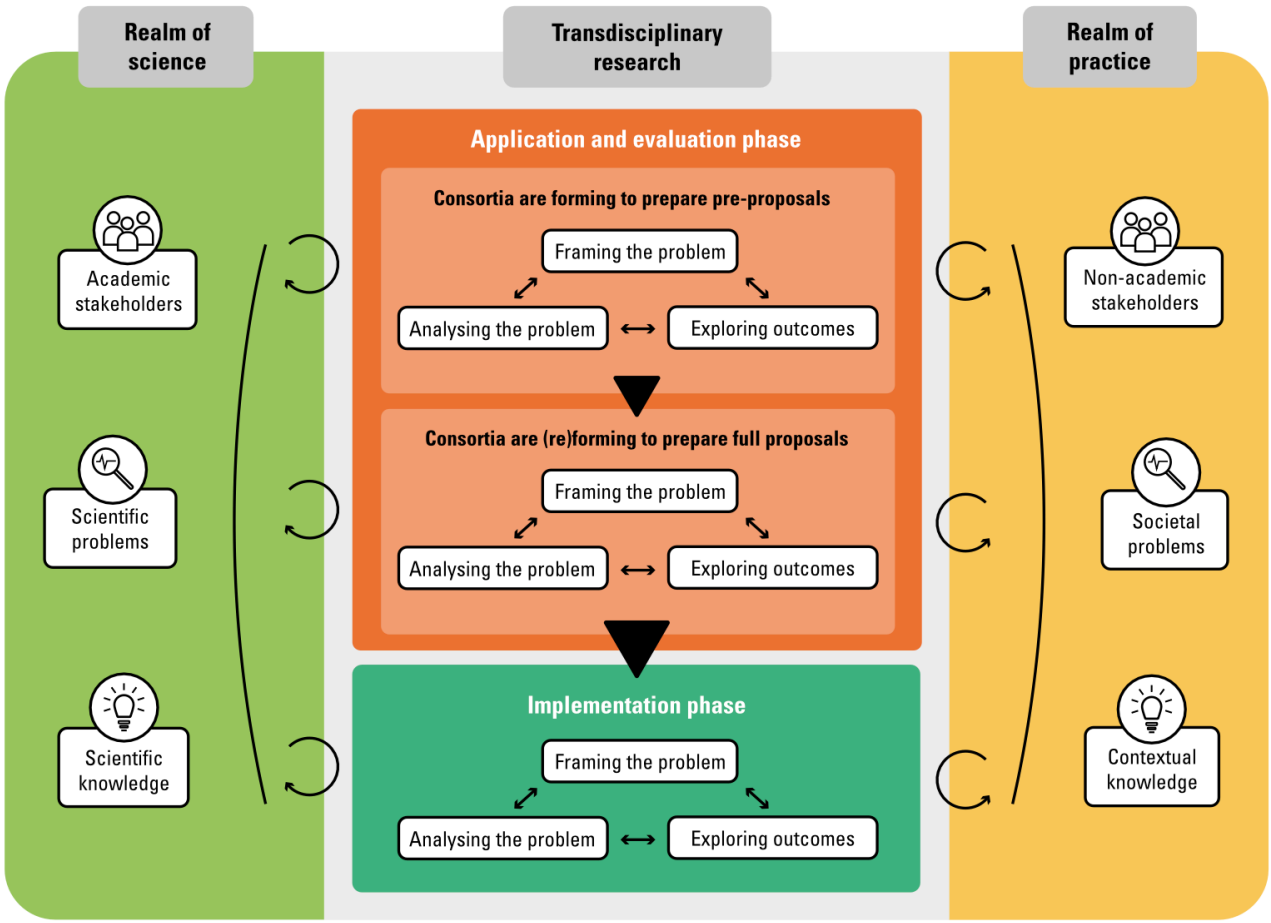
TRANSDISCIPLINARY PROJECTS FOR THE ES2050

With its Energy Strategy 2050 (ES2050), the Swiss federal government aims to transition the country's energy supply to renewable sources and optimize efficiency by the year 2050. Research can play a key role in achieving this goal if it takes a transdisciplinary approach — that is, if it produces not only important scientific publications but also results that contribute to the implementation of the Energy Strategy 2050. The Swiss Federal Office of Energy is currently testing how this can be achieved through the SWEETER research funding instrument. Funding programmes in other subject areas will also benefit from these findings.



A schematic representation of how the transdisciplinary approach is incorporated into the SWEETER calls for proposals. Graphic: SFOE

A technical article on the experiences gained from implementing the transdisciplinary research approach within the SWEETER research funding instrument run by the Swiss Federal Office of Energy. The article has been published on the site ee-news.ch (July 2026), amongst other places.

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Research drives innovation. This includes technical innovations that lead to better products. For example, it is thanks to researchers that the efficiency of photovoltaic cells has been significantly improved. In addition to technical innovations, there are systemic innovations. These have an impact across various sectors and entire value chains. One example is smart meters. They enable automated reading of electricity consumption and allow the networking of households, electricity providers, and decentralized power plants, which expands the electricity supply system to include new forms of flexibility and business models.

SWEET is followed by SWEETER

The Swiss Federal Office of Energy (SFOE) supports energy research through various funding instruments. These currently include the SWEETER (short for Swiss Research for the Energy Transition and Emissions Reduction) funding instrument. In April 2026, the SFOE, together with the Federal Office for the Environment (FOEN), launched a first call for proposals: The call seeks a research consortium to investigate, over a period of six years, how industrial processes can be supplied with renewable energy. A total of 12 million Swiss francs in funding is available. Four additional SWEETER calls for proposals on various topics are expected to follow in the coming years.

SWEETER is the successor instrument to SWEET (short for Swiss Energy Research for the Energy Transition). From 2020 to 2024, seven SWEET research consortia were commissioned through competitive calls for proposals, which will receive total of 125 million Swiss francs. Each of them will be conducting research on a set of clearly defined topics for six to eight years. The overarching goal of the SWEET and SWEETER funding instruments is to help the Energy Strategy 2050 achieve a breakthrough in systemic innovations in various areas of the energy system. Both funding instruments are administratively grouped under the SWEET programme.

As part of the SWEET programme, workshops are held in which knowledge and technology transfer and integration officers of the consortia, as well as experts from td-net, take part. Photo: A. Fäs

Involvement of practice partners

"It is important to us that the research supported by the SFOE not only produces scientific publications, but that its results lead to tangible changes in businesses and society and, in this way, contributes to the goals set out in the Energy Strategy 2050," says Annina Fäs, an expert in knowledge and technology transfer (KTT) at the SFOE. To achieve this, the SFOE has been collaborating with the Network for Transdisciplinary Research (td-net) of the Swiss Academies of Arts and Sciences since mid-2023.

The td-net is a center of excellence for transdisciplinary research. At its core, "transdisciplinary" means that scientists do not work solely within their own field, but rather colla-

TRANSDISCIPLINARY VERSUS INTERDISCIPLINARY

Research projects generally fall within a specific scientific field — that is, a discipline such as electrical engineering, biology, or psychology. If a research project involves collaboration among academic researchers from different fields, in which disciplinary bodies of knowledge are not merely combined (multidisciplinary) but integrated, the project is interdisciplinary. If a research project also integrally involves representatives from various sectors outside of academia, the project is transdisciplinary. Consequently, transdisciplinary research projects are always interdisciplinary in nature.

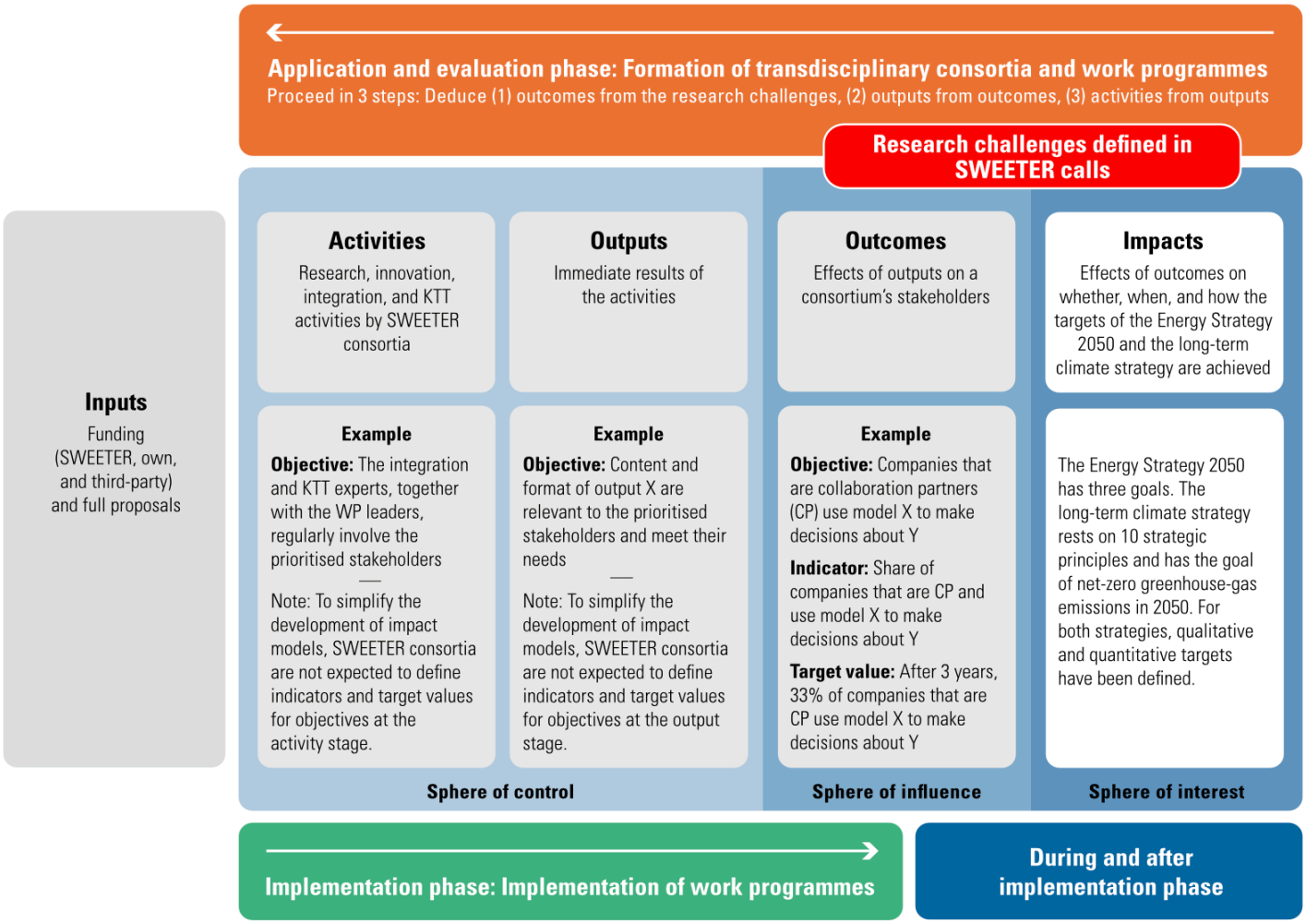
Transdisciplinary research occupies a middle ground between basic research and applied research. It is less focused on the interests of a single scientific tradition, professional organization, or other particular interests, and instead addresses issues of the common good and problems affecting society as a whole.

borate across the boundaries of their discipline — with other disciplines and with the non-academic world. A transdisciplinary team consists not only of scientists but also includes non-academic partners. These can be companies or industry associations, as well as federal, cantonal, and municipal government agencies, nongovernmental organizations, or interested citizens.

Wicked problems

"The transdisciplinary approach is recommended when dealing with 'wicked problems'— that is, socially complex and politically contentious challenges such as those encountered in the areas of biodiversity, pandemic prevention, urban development, or the climate crisis," says td-net project leader Stefan Müller. Müller himself conducted transdisciplinary research while writing his doctoral dissertation as an environmental social scientist at ETH Zurich, collaborating not only with a political scientist and an architect, but also with three SBB employees who were, for two years, part of the research team.

"Our goal is for a significant number of practice partners to be represented in newly formed SWEETER consortia, where they can actively contribute their perspectives and experiences and systematically participate in the research," says Müller. He illustrates how this might work using the example of the latest SWEET consortium, ACHIEVE, which is investigating reducing greenhouse gas emissions toward net zero. In this case, for example, it would be valuable to involve people from concrete manufacturing companies or farmers, says Müller: "The concrete and agricultural industries generate significant greenhouse gases that are difficult to avoid.



The transdisciplinary focus of the SWEET and SWEETER funding instruments is primarily aimed at the outcomes level. The effects of impacts can only be realized the medium term. Graphic: SFOE

Their representatives can bring a practical perspective to the research. They can identify areas where they need solutions through research and collaborate directly on their development. They can also help to ensure that research projects are implemented in ways that allow their results to yield practical benefits." This helps prevent scientists from conducting research in a vacuum, or innovations from fizzling out in practice.

Binding requirements

The involvement of practice partners was already required in the first SWEET call for proposals in 2020. However, experience has shown that transdisciplinary work generally poses a challenge for researchers. With the launch of the SWEETER funding instrument in the spring of 2026, the SFOE — in collaboration with the td-net — has now consistently aligned the guidelines for calls for proposals, evaluation, and monitoring with a transdisciplinary approach:

- The call for proposals clearly and systematically requires the research consortia to adopt a transdisciplinary approach. As early as the project outline (pre-proposal) stage, applicants must submit a stakeholder analysis — that is, a list of the stakeholders relevant to the consortium and its research questions, who must be involved from the very beginning. An impact model is also required, one that not only outlines the expected scientific publications, recommendations for action, or practice-oriented products and services (outputs), but also the intended effects (outcomes) on stakeholders. In the medium term, these outcomes will lead to the changes (impacts) called for in the Energy Strategy 2050.
- Practice partners should increasingly participate as full members of the consortium and thus also receive funding. In addition, they — or their institutions — should be allowed to lead consortia.
- Consortia that are invited, based on the evaluation of their project outlines, to develop a formal funding proposal will be given approximately three months to prepare it. They will also receive 25,000 Swiss francs in support. During this time, the academic and non-academic members of the research consortium should get to know one another and develop a shared understanding of the research topic (problem framing). This is necessary because both sides have very different backgrounds and must first ensure that they are "on the same page."
- Upon request, td-net staff support the consortia during the second phase of the application process (the full-proposal phase) through workshops or by providing targeted advice during the implementation phase.

Step-by-step effectiveness

"We have gradually incorporated the fundamental principles of transdisciplinary research into our work, thereby laying the groundwork for more effective collaboration between the academic and non-academic worlds," says Andreas Haselbacher, who is responsible for developing the SWEET programme. For example, since late 2023, the SWEET consortium reFuel.ch — coordinated by Empa, which has traditionally been strongly practice-oriented — has been making efforts toward transdisciplinary research. The consortium has enlisted several industry partners to conduct research on sustainable fuels.

SWEET and SWEETER are Switzerland's largest research funding instruments with a transdisciplinary focus. "Consistently aligning funding instruments with a transdisciplinary approach is a major challenge, which is why close collaboration with the specialists at the td-net is so valuable," says KTT expert Annina Fäs. The results are also likely to spark interest among other funding agencies. These include the Swiss National Science Foundation, which, for example, takes a transdisciplinary approach in the National Research Program (NRP) 82 Biodiversity and Ecosystem Services, as well as other federal offices, the innovation promotion agency Innosuisse, and private funding foundations. These organizations have come together in an informal working group coordinated by the td-net to exchange experiences with transdisciplinary research.

In 2016, Empa in Dübendorf, which heads the SWEET consortia ACHIEVE and reFuel.ch, created NEST, a modular research building that has since facilitated cooperation between scientists and practice partners. Photo: Empa

Recommendations to policymakers

The collaboration between SFOE and td-net involves not only the call for proposal and implementation of energy research projects, but also the dissemination of results to target groups that are difficult for individual consortia to reach. One of these target groups consists of members of the Federal Assembly and cantonal parliaments. A communication instrument was developed for them that summarizes the results of all SWEET/SWEETER consortia concisely in action-oriented recommendations. Members of the consortia present and discuss these recommendations with representatives of the target group during in-person meetings held as part of existing events.

- **Information** can be obtained from Annina Fäs, who is responsible for the SFOE's Knowledge and Technology Transfer programme, and td-net project manager Stefan Müller.

- Further **technical articles** in the field of knowledge and technology transfer.

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