

Annual report 2017

Energy Discourses in Switzerland

Prerequisites for change





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Agent:

School of Applied Linguistics
Zurich University of Applied Sciences (ZHAW)
Theaterstrasse 15c
8401 Winterthur
<https://www.zhaw.ch/en/linguistics/>

Authors:

Peter Stücheli-Herlach, ZHAW, peter.stuecheli@zhaw.ch
Maureen Ehrensberger-Dow, ZHAW, maureen.ehrensberger@zhaw.ch
(in absentia) Maren Runte, ZHAW, maren.runte@zhaw.ch

Project team:

Dominik Batz, Anna Bonazzi, Alice Delorme Benites, Philipp Dreesen, Marcel Eggler, Sabine von Fischer, Matthias Fluor, Julia Krasselt, Christoph Lauper, Lorenza Pescia de Lellis, Sarah Pulfer, Sekhar Ramakrishnan, Romina Schaub-Torsello, Natalie Schwarz, Patrick Tschirky

SFOE head of domain: Anne-Kathrin Faust, anne-kathrin.faust@bfe.admin.ch

SFOE programme manager: Marianne Zünd, marianne.zuend@bfe.admin.ch

SFOE contract number: SI/501446-01

The authors of this report bear entire responsibility for its content and conclusions.

Swiss Federal Office of Energy SFOE

Mühlestrasse 4, CH-3063 Ittigen; postal address: CH-3003 Bern
Phone +41 58 462 56 11 · Fax +41 58 463 25 00 · contact@bfe.admin.ch · www.bfe.admin.ch



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List of abbreviations

PAB	<i>Politikadressaten und politikbetroffene Akteure</i> (industry-related)
PBV	<i>Politikbeobachtende und -vermittelnde Akteure</i> (media-related)
PEB	<i>Politikentwickelnde und -beratende Akteure</i> (academia-related)
PFU	<i>Politikformulierende und -umsetzende Akteure</i> (policymakers)
Swiss-AL	digital texts publically available on Swiss internet domains that have been collated in a corpus by the ZHAW School of Applied Linguistics
Swiss-AL-ED	digital texts publically available on Swiss internet domains that are related to energy discourses and have been collated in a corpus by the ZHAW School of Applied Linguistics
ZHAW	<i>Zürcher Hochschule für Angewandte Wissenschaft</i> (English: Zurich University of Applied Sciences)



Project goals

The project focuses on the communicative prerequisites for energy-relevant transition processes and innovations in Switzerland. Publically available texts from a broad spectrum of participants, collated in a digital corpus, are analysed with a view to identifying interlinked discourse processes related to energy issues. The principle interest lies on thematic structures and linguistic patterns in the democratic dialogue about energy.

Summary

Issues surrounding the production, supply, and use of energy will continue to be of great concern to Switzerland over the next few years and decades to come. In the project “Energy discourses in Switzerland”, researchers in the ZHAW School of Applied Linguistics are investigating the communicative prerequisites for the anticipated changes. The objective of the project is to identify how patterns of language use surrounding energy issues develop across institutions, media, and societal sectors in the three official Swiss languages (German, French, Italian) as well as the international lingua franca (English). The methodology being developed in the project involves corpus-based and corpus-driven analyses of digital texts from the communicative fields of interest, in-depth analyses of patterns of language use and texts in Swiss energy discourses, and mapping to convey the interconnections among and to the various actors involved in the transition to sustainable energy systems and in the democratic dialogue.

In 2017, the focus was on substantially expanding the existing multilingual corpus of digital texts with respect to both volume and breadth in order to adequately model publically accessible Swiss discourses on energy. The most recent release of the Swiss-AL corpus (Sept17) comprises over 1 billion tokens distributed across 3.75 million texts from over 300 Swiss internet sources. The sampling criteria were linguistic, geographic, thematic, and situative (e.g. related to political, societal, or natural events). This report outlines exemplary results of the project work in the first year of the 3-year project, including exploratory analyses of the corpus and comparisons of the discourses typical of actors whose public communication is in one of the Swiss national languages or some combination of them. The focus of the next project years will be on systematically analysing discourse controversies and coalitions in order to identify discursively linked actor networks.



Work undertaken and findings obtained

1. Background

To describe societally important issues as complex as energy supply and consumption ('wicked problems'), modelling of discourses must adequately account for the interactions within and between policy networks that include government, business, society, and academia as well as the journalistic, organizational, and social media that decisively frame the interactions through ongoing, location-independent interventions (cf. Rosenberger & Kleinberger 2017; Stücheli-Herlach 2013; Stücheli-Herlach et al. 2015). The focus of this project is on current discourses, so the timeframe of interest is from just before the Fukushima Daiichi nuclear disaster (2011) up to the last project year (2019). The first phase of work in the project year involved identifying events relevant to energy discourses in a timeline as well as the main actor classes and actors in the communicative fields of interest, as presented in section 2. On the basis of these situative analyses, the Swiss-AL corpus was expanded and extended in an iterative process that allowed the initial quantitative explorations of energy discourses summarized in section 3. The first in-depth study of the project exploited the corpus to validate the argumentation patterns identified in the information brochures sent to Swiss voters in preparation for the popular vote on the Energy Act (see section 4). In multilingual Switzerland, discourse takes place in three different languages that enjoy equal official status as well as in English. Because of the importance of multilingualism to Swiss identity, the project work outlined in the following sections has been carried out in the three official Swiss languages unless otherwise indicated.

2. Events and actors

The main events related to political, societal and natural energy issues in Switzerland were identified through intensive web research, and then the interest in them was determined on the basis of voting turnouts or uptake in the media in the respective language. The Factiva and Argus databases were consulted for this purpose for German and French. The absence of important Italian-language media in these databases required a different approach, so a manual search in the *Sistema bibliotecario ticinese* was carried out. The events were categorized as minor, medium, or major based on the number of articles about them (i.e. <5, 5-19, or > 20, respectively) or the voting turnout (e.g. <30%, 30-50%, or >50%, respectively; see Figure 1 for an example).

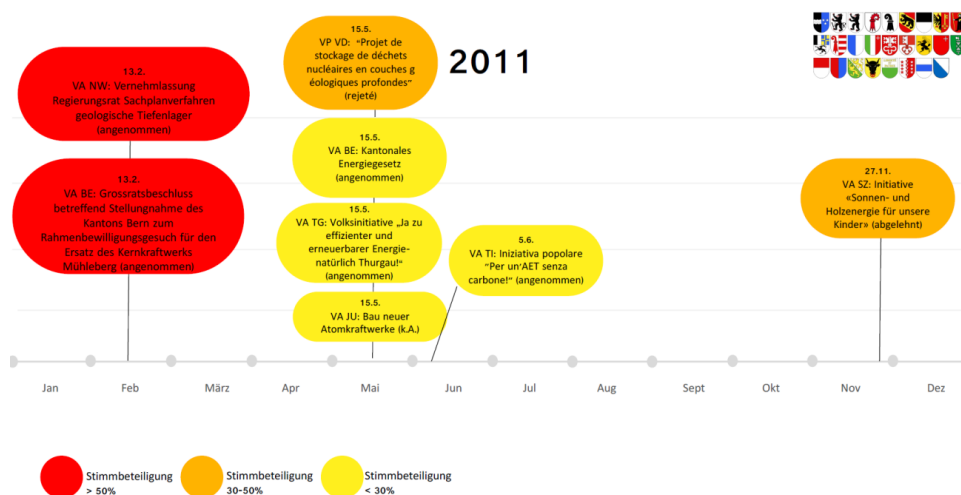


Figure 1. Political events at the cantonal level related to energy issues identified for 2011



The main actors in Swiss energy discourses were ascertained through an extended sampling process that resulted in four main actor classes: industry-related (PAB); media (PBV); academia (PEB); policymakers (PFU), each of which has numerous sub-classes. The internet websites of actors in these classes and subclasses were incorporated in the releases of the Swiss-AL corpus over the course of the project year, resulting in different relative proportions of the actor classes (see Figure 2).

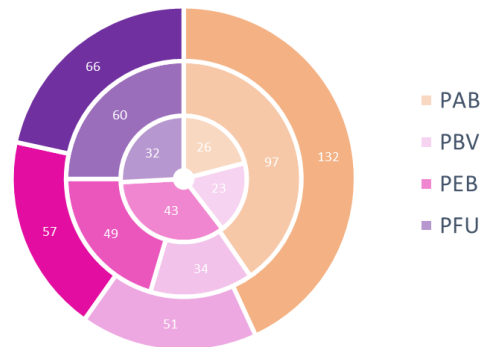


Figure 2. Development in reporting year of the Swiss-AL corpus with respect to included number of actors and proportion of actor classes (March17, July17, Sept17 from inside outwards)

3. Explorative analyses of Swiss energy discourses

The Swiss-AL corpus has been systematically expanded and extended during the project year: from the approximately 480 million tokens and 30,000 texts at the end of 2016 to its current size of 1.19 billion tokens distributed over 3.75 million texts from 306 sources identified as having the potential to contribute to energy discourses. For the purpose of language-specific analyses, four sub-corpora of varying sizes with respect to number of texts and tokens have been derived from the Swiss-AL corpus release of September 2017 (see Figure 3). As a comparison, the largest German-language corpus currently has almost 33 billion tokens (*DoReKo, Deutsches Referenzkorpus*) but, similar to other very large corpora, it is not topic- or country-specific, and is sentence- rather than text-based.

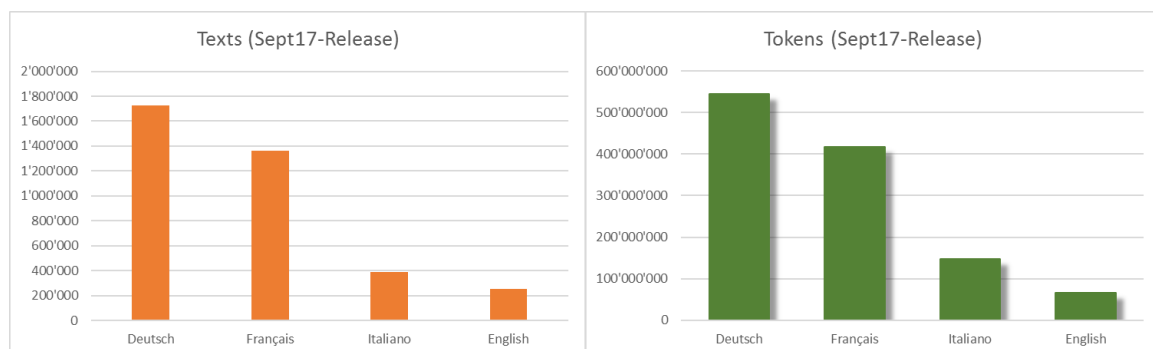


Figure 3. Size of language-specific Swiss-AL sub-corpora by number of texts and tokens

The distribution of sources in the Swiss-AL corpus by language does not perfectly reflect the relative proportions of speakers in Switzerland (i.e. 63%, 23%, 8%, and 5% who claim German, French, Italian, and English, respectively, as their main language)ⁱⁱ for several reasons:

- the thematic focus of the Swiss-AL corpus (as a precursor of the Swiss-AL-ED corpus), which determines the number and type of sources;
- the sampling criteria, which slightly favor French and Italian in the interest of allowing comparisons;
- the multilingualism of some sources, due to translated (partial) versions of the same website.



A statistical procedure known as topic modeling using the *Mallet* software (cf. Blei 2012; McCullum 2002) identified several clusters of words highly related to energy issues in the German-language sub-corpus (see Table 1 for the top 20 words in each of the first few topics). The same procedure is being applied to the French, Italian, and English sub-corpora. Once significant topics are determined and assessed in all of the languages, it will be possible to do explorations of discourse controversies and coalitions on a thematic level.

Topic	Top 20 words in this topic
0	prüfung kandidat schriftlich note bestehen zulassung anmeldung kandidatin mündlich mindestens modul bestanden experte lehrgang bewertung wer wiederholung erfolgreich entscheiden
1	management organisation prozess strategisch führung mitarbeitende intern unternehmen strategie risiko extern operativ case modell umsetzung dienstleistung steuerung leistung system betrieblich
2	anlage kraftwerk energie strom wasserkraft erneuerbar mw leistung card gwh kwh adev schweiz wasserkraftwerk produktion rund produzieren neu windenergie wind
3	person stellensuchende rav arbeitsmarkt quote arbeitslosigkeit vormonat monat arbeit arbeitslose arbeitslosenversicherung zahl arbeitslosenquote mehr region arbeitslos seco wirtschaft arbeitnehmer solothurn
4	gerät stromverbrauch strom haushalt energieeffizienz energie sparen jahr kwh energieverbrauch viele effizient verbrauchen verbrauch mon elektrisch pro gut elektrogerät standby
...	...

Table 1. Extract from the results of topic modeling of all the pdf files in the Swiss-AL German sub-corpus (Sept17)

Another method to ascertain thematic structures compares how often words or terms associated with issues appear in texts at different points in time. Corpus linguistic techniques are used to include all varieties of the relevant word, with the resulting peaks, plateaus, and troughs in a frequency graph reflecting the degree of attention devoted to certain issues in the corpus being examined. For example, the frequency of all varieties of the term associated with banking secrecy (*Bankgeheimnis*) peaked at 60 words per million in the 1st quarter of 2009 in German-language media texts, coinciding with the decision by the Swiss government to yield to international pressure and accept the OECD Model Tax Convention (see Figure 4). By contrast, the occurrence of the term related to old-age pensions (*Altersvorsorge*) was very low until the end of the third quarter of 2017, when the proposals to reform the pension plans were rejected in popular votes. After a relatively constant level of interest from 2007-2014, the frequency of mentions of energy (*Energie*) alone or as a constituent of compound words, which are especially common in the German language (e.g. *Energieeffizienz*), has been fluctuating at a much higher level since 2015.

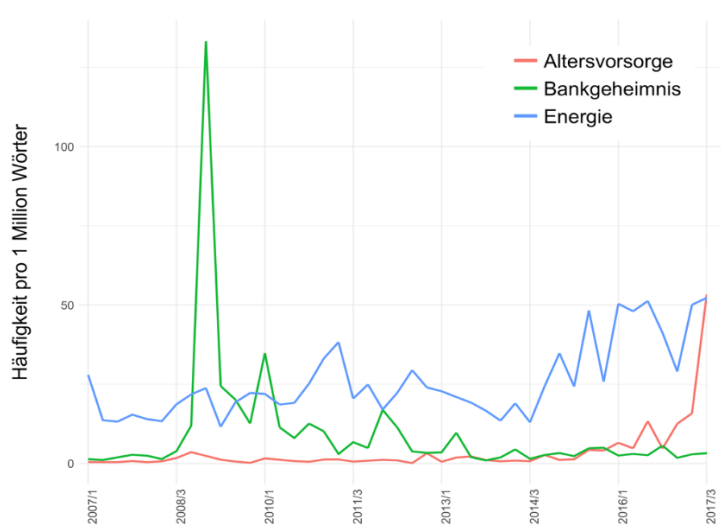


Figure 4. Frequency of terms associated with current affairs in German-language media in Switzerland (2007-2017, per million words, Sept17 release)

Similarly, it is possible to trace the influence of events such as the Fukushima Daiichi nuclear disaster on public discourse by mapping the frequency of references to that event in texts (see Figure 9, in Appendix; cf. Stücheli-Herlach, Tanner & Batz 2017). Although the dramatic peak at the beginning of 2011 quickly dropped to a relatively low frequency in German-language media texts overall, the

number of texts referring to renewable energy (*erneuerbare Energie*) that mention “Fukushima” increased noticeably in the lead-up to the popular vote on the federal Energy Actⁱⁱⁱ (see Figure 5). Far fewer texts referring to atomic energy (*Atomkraft*) mention “Fukushima” although the pattern of peaks and troughs over time is similar (see Figure 10, in Appendix).

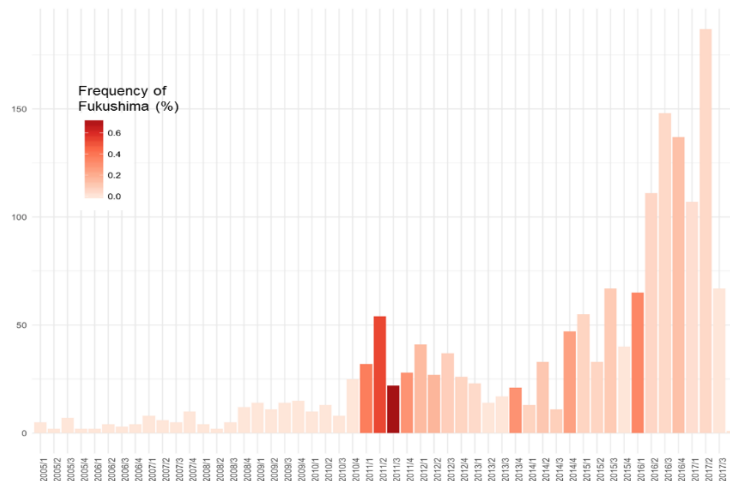


Figure 5. Co-occurrence of “Fukushima” in German-language media texts with “erneuerbare Energie” in Switzerland (2007-2017, number of texts, Sept17 release)

The changes over time of terms associated with energy issues provide indications of the development of public discourses. For example, terms strongly associated with atomic energy (*Atomkraft*), nuclear withdrawal (*Atomausstieg*), and renewable energy (*erneuerbare Energie*) all evinced frequency peaks in German-language media in Switzerland in 2011 before dropping off to relatively stable baseline levels. The frequency of nuclear withdrawal peaked dramatically at the time of the vote on the Nuclear Withdrawal Initiative^{iv} and then immediately dropped back to the low baseline. Occurrences of renewable energy also rose at that time but seemed to stabilize at a higher level, even after the popular vote on the federal Energy Act. In the same quarter as the popular vote, the frequency of occurrences of hydro power (*Wasserkraft*) rose significantly and stayed high into the subsequent quarter. The next release of the Swiss-AL corpus, planned for 2018, will be analysed to determine whether this trend continued.

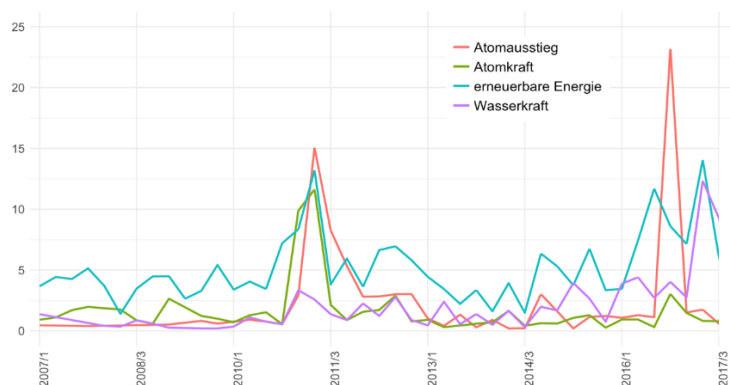


Figure 6. Frequency of terms associated with energy issues in German-language media in Switzerland (2007-2017, per million words, Sept17 release)



4. Potential for distortion in multilingual sources

The phenomenon of various areas of Switzerland exhibiting contrasting patterns of voting on societal issues might be linked to urbanization, to cultural diversity, or to geographical proximity to other countries' discourses. Although the claim has been made that linguistic differences are playing less of a role in such patterns (cf. Goldberg 2017), a recent newspaper article drew attention to multilingual text production practices in the federal government that have implications for how energy issues are explained when they are put to popular vote.^v The explanatory pamphlets that are sent to all Swiss citizens eligible to vote are meant to be objective and to present the “views of important minorities and the opinions of parliament and the Federal Council”^{vi} as well as the arguments of the support committee in the case of initiatives or referenda. They are widely distributed in three national languages (i.e. German, French, and Italian) depending on the dominant language of the respective community responsible for the distribution of the voting materials. However, these explanatory pamphlets and other government sources of information have become targets of criticism not only because of their outmoded presentation of information but also for an imbalanced representation of both sides of issues.

A deeper understanding of differences between discourses from multilingual sources (i.e. at the national level) and from monolingual sources (i.e. local discourses in various languages) could contribute to fostering democratic dialogue on key issues. Just as translations often contain traces of the language of source texts, multilingual sources might be dominated by whichever national language the content was first formulated in, which in turn may (un)intentionally misrepresent the complexity of the multilingual discourses in Switzerland about production, supply, and use of energy now and in the future. To test this hypothesis, an analysis of the explanatory pamphlets issued in advance of the popular vote on the Energy Act was carried out to identify argumentative patterns, and the findings were triangulated with results from the Swiss-AL corpus.

Due to space constraints, only one of the patterns thus identified is presented here in order to demonstrate the types of insights that can be gained with the project methodology. The analogy topos occurred in all three language versions of the explanatory pamphlets in that references were made to Germany in support of the need to promote renewable sources of energy in Switzerland (e.g. *In Deutschland wurden die erneuerbaren Energien stark gefördert*; *L'Allemagne a fortement encouragé le recours aux énergies renouvelables*; *In Germania le energie rinnovabili sono state fortemente sostenute*). There is a difference between the three languages with respect to how frequently renewable energy and Germany were mentioned, with the highest rates of occurrence in the German-language texts in the corpus (see Figure 7). If only the texts that mention renewable energy are included in the analysis, however, then the Italian-language sub-corpus evinces a much higher occurrence of references to Germany than the other two sub-corpora do (the third column for each language in Figure 7). One interpretation would be that there is simply much more use of the analogy topos in Italian discourse about renewable energy than in the other two languages.

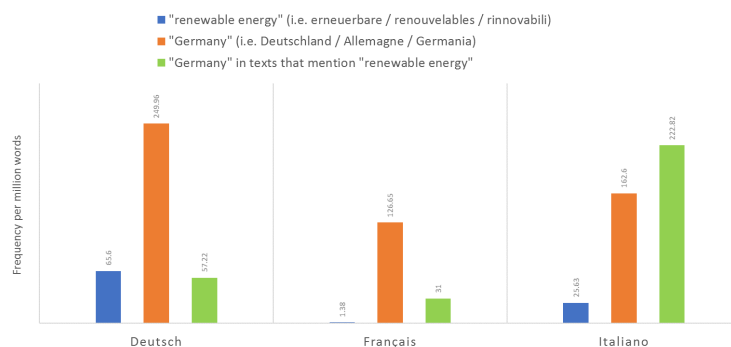


Figure 7. Occurrences of elements in the analogy topos in the language-specific Swiss-AL sub-corpora (per million words, Sept17 release)



Another explanation has more to do with sampling criteria than discourse characteristics. As explained in the previous section, many of the websites that were sampled had different language versions. Although not explicitly identified as such, one version can be assumed to be the original content and the others to be translations or adaptations. Italian being less dominant than the other two languages in Switzerland, it can also be assumed that there are more translations in the Italian-language sub-corpus than in the German- or French-language sub-corpora. This was confirmed in a subsequent analysis of the sub-corpora filtered for monolingual sources (i.e. websites with only one language version; see Figure 8). The patterns for the monolingual German- and French-language corpora show little difference from the complete sub-corpora, but the frequency of references to Germany in texts that mention renewable energy is much lower in the monolingual Italian-language sources than in the Italian-language texts in general. The high frequency of references to Germany in Italian-language texts may thus reflect the potential of translation to distort or misrepresent discourses, or it may reveal an artifact of sampling procedures that can contribute to methodological refinements in later stages of the project.

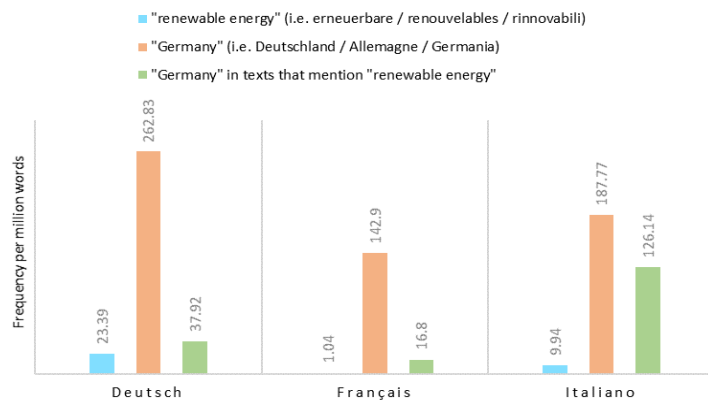


Figure 8. Occurrences of elements in the analogy topos in the monolingual sources in the language-specific Swiss-AL sub-corpora (per million words, Sept17 release)

National cooperation

Members of the project team collaborated with swissuniversities and swissnex in order to contribute to the international seminar *Towards Smart Cities – Integrated Approaches* at Expo 2017 in Astana (Kazakhstan) in June of the reporting year.^{vii} The project was also represented at the *Swiss Innovation Energy Days* in New York City at the invitation of the Swiss Federal Office of Energy. Contact has been established with most of the corpus linguistics research groups in the Zurich area and deepened at a workshop organized by the project team. At a transdisciplinary level, dissemination and cooperation will be fostered at various events in the next project year.

International cooperation

One of the project leaders is part of an international group interested in interdisciplinary perspectives on research into environmental and risk discourses. The project was presented at a workshop in Augsburg; next year's meeting is already planned. Presentations about the project were also done upon invitation at an international seminar about translation and interpreting in political settings in Birmingham, England, and at an international conference on disruption and diversification in Brisbane, Australia. Project members are involved in the organization of the 5th *European Conference on Behaviour and Energy Efficiency*, to take place in 2018.



Evaluation 2017 and outlook for 2018

The focus of the 2017 reporting year was the expansion and extension of the project corpus (see Table 2, in Appendix). The increased efficiency of sampling resulted in unexpected challenges with respect to data quality, since the volumes handled by the corpus pipeline are approaching those more typical of big data projects. The value-added of meta-data and linguistic annotation, including language identification prior to tagging for multilingual sources, has allowed for the sophisticated queries that are crucial to addressing discourse linguistic questions. Methodological developments and detailed results are documented in forthcoming publications, including the research report delivered to the SFOE. Because of the exposure that the project received during international events in the reporting year and the anticipated participation of project members in several academic and transdisciplinary events in 2018, the dedicated transfer workshop originally foreseen for the end of 2017 or early 2018 has been postponed until the subsequent year.

In the second project year (2018), the results of corpus and discourse analyses will be triangulated as significant topics are identified in the language-specific sub-corpora (i.e. German, French, Italian, English) and indications of discourse controversies and coalitions are ascertained. Project work will intensify in the areas of visualization and mapping of interconnections in order to make the findings more accessible to the various actors involved in energy discourses in Switzerland. Language-specific argumentation patterns and the role of English as a lingua franca in Swiss energy discourses will be examined in particular depth.

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Appendix

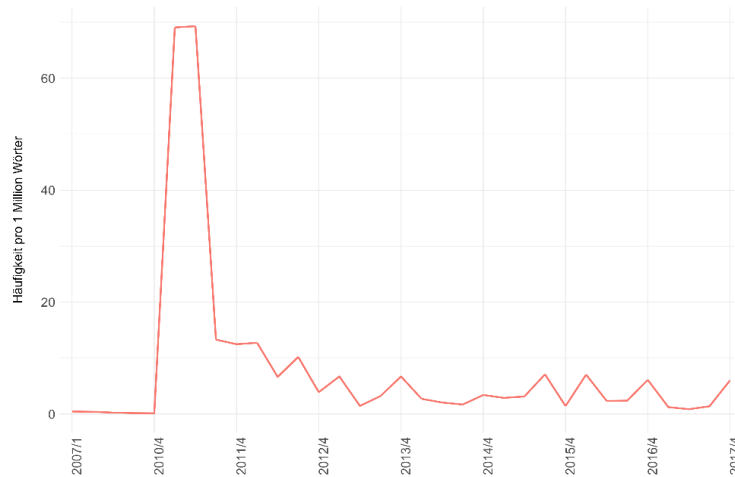


Figure 9. Frequency of occurrences of Fukushima in German-language media in Switzerland (2007-2017, per million words, Sept17 release)

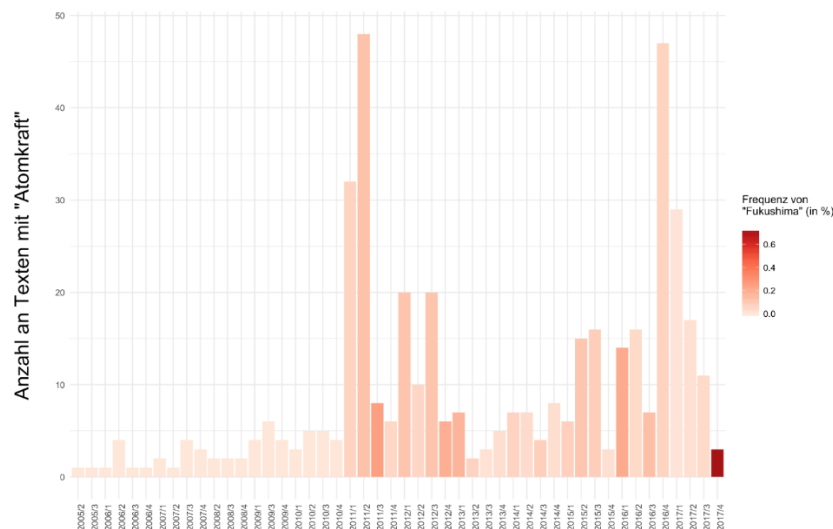


Figure 10. Co-occurrence of "Fukushima" in German-language media texts with "Atomkraft" in Switzerland (2007-2017, number of texts, Sept17 release)

Reporting year	2016				2017				2018				2019			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Corpus development																
Operationalization																
Corpus analysis																
Discourse analysis																
In-depth studies																
BFE reporting																
Transfer																

Table 2. Updated project plan adjusted in consultation with the project steering committee.



ⁱ As of 1/10/2017, <http://www1.ids-mannheim.de/kl/projekte/korpora/>.

ⁱⁱ As of 2015, <https://www.bfs.admin.ch/bfs/de/home/statistiken>

ⁱⁱⁱ <https://www.admin.ch/gov/en/start/documentation/votes/Popular%20vote%20on%2021%20Mai%202017/Energy-Act.html>

^{iv} <https://www.admin.ch/gov/en/start/documentation/votes/20161127/Nuclear-Withdrawal-Initiative.html>

^v <http://www.tagesanzeiger.ch/schweiz/standard/das-bundesbuechlein-wird-moderner-farbiger-und-ausgewogener/story/27681589>

^{vi} <https://www.bk.admin.ch/glossar/index.html?lang=en&action=id&id=99>

^{vii} Official press release, www.zhaw.ch/de/ueber-uns/aktuell/news/detailansicht-news/news-single/zhaw-mitarbeitende-im-rahmen-der-expo-2017-in-astana/