University of St.Gallen

Institute of Responsible Innovation, Sustainability and Energy

IAEE EUROPEAN CONFERENCE
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When ”made in Europe” is more important than money

Investigating the role of community benefit schemes on community acceptance of wind energy in Switzerland

IAEE European Conference in Munich
CS 7.5 Renewables 1

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Martina Schwizer

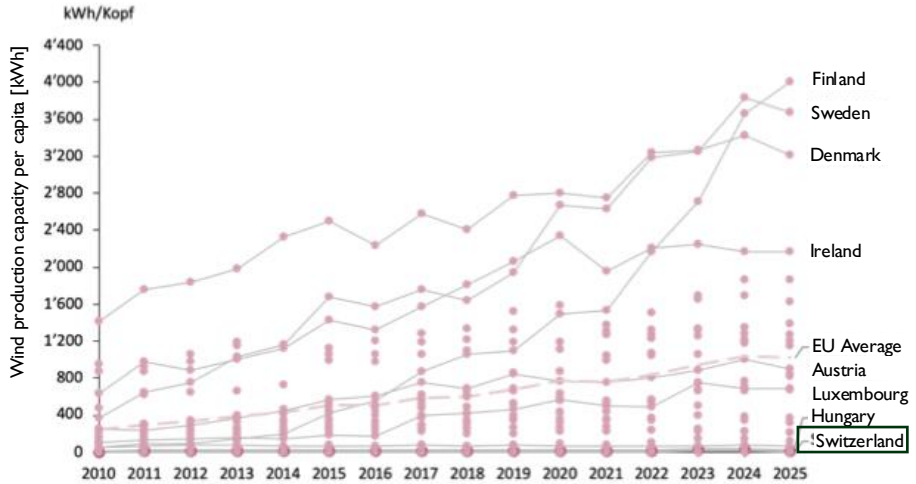
Introduction

Martina Schwizer

March 2025 -	Research assistant & doctoral candidate at the Institute of Responsible Innovation, Sustainability & Energy at the University of St.Gallen
2022 -2025	Consultant on Decarbonization strategies
2019 – 2021	Dual Degree in Climate Policy and International Relations, Sciences Po Paris & HSG
	Managing Climate Solutions certificate from HSG
	SAEE award-winning master's thesis on the role of emotions in political campaigns in 2023

Climate Change with Needed Energy Transition vs. Local Acceptance

- Global & Swiss climate goals → wind energy crucial for energy security
- Switzerland ranks 25/28 in wind energy production in Europe
- Local acceptance with slow project implementation remains major barrier
- Findings on how community benefit schemes influence community acceptance remain mixed
- Many papers still rely on national samples so far while missing local-specific attitude captures



Source: Hälg (2026)

RQ: Which conditions in wind energy project development positively or negatively influence community acceptance among citizens living in the close vicinity of a wind farm?

Sources: (Ellis et al., 2023; Hälg, 2024,; IPCC, 2011; IRENA, 2021; Lazard Power, Energy & Infrastructure Group, 2024)

Methods

- The study aimed to investigate which factors influence local acceptance of a hypothetical wind farm in the St. Gallen region and what role wind resource tax («Windzins») plays in this context.
- Survey of *N* = 322 residents living within a 10-km radius of the Peter and Paul Wildlife Park (St.Gallen)*.
- Recruitment was conducted via leading Swiss consumer panel Intervista **
- Survey period: October 9–24, 2025
- The sample (N = 322) is representative in terms of age and gender (+/-5%).

Map created by S. Küffner

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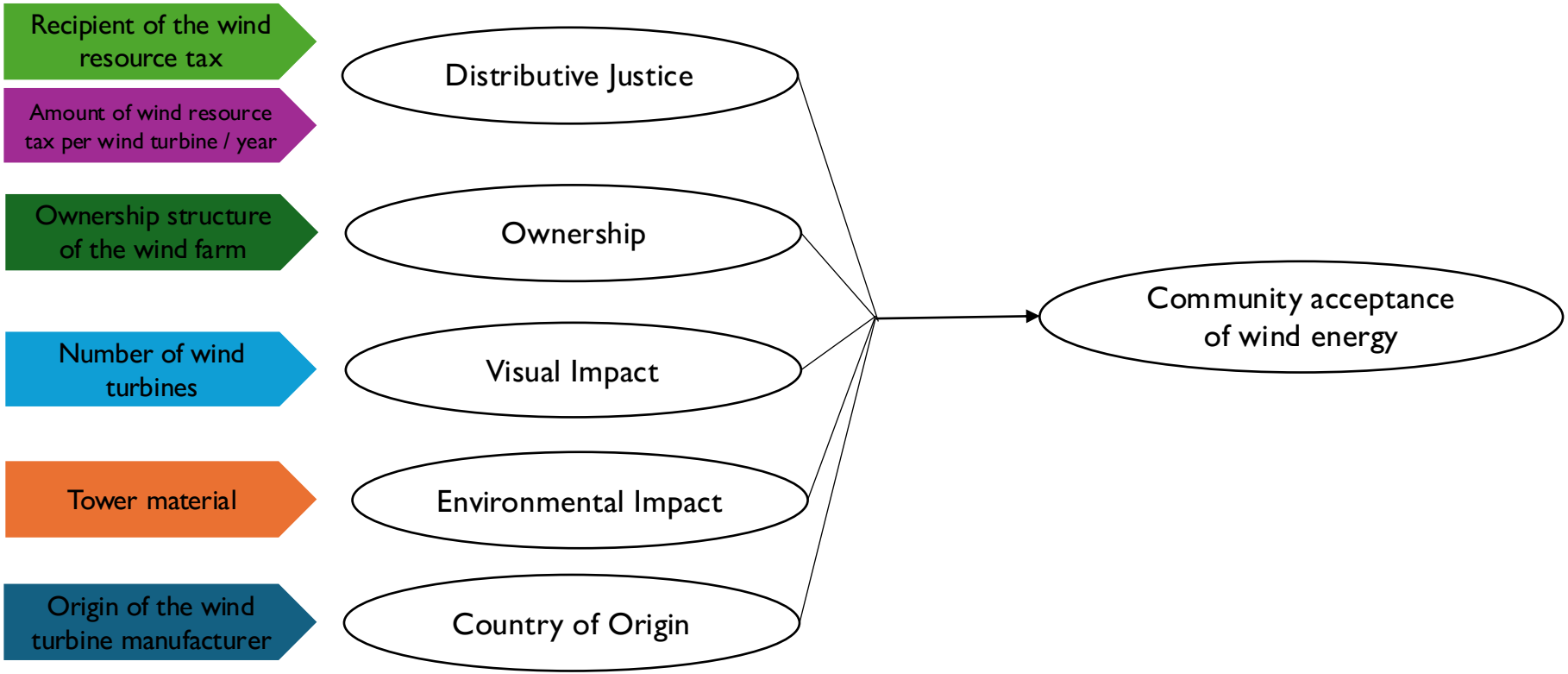
*Over 40% of the municipality's inhabited area must be included within the radius so that residents of the municipality werealso invited to participate in the survey
** N (CH) ≈ 150,000, N (study area) ≈ 2,900.

Factors/attributes examined



Sources: (Knauf, 2022; Molnarova et al., 2012 Global Wind Energy Council, 2025; GWEC, 2026; Knauf & le Maitre, 2023; Knauf & Wüstenhagen, 2023)

Options - Explanation

Number of wind turbines* How many wind turbines will be built at the "Peter and Paul" wind farm?	1 2 3
Origin of the wind turbine manufacturer Which country is the wind turbine manufacturer from?	Denmark China USA
Tower material What material is the tower (the largest component of the wind turbine) made of?**	Steel Concrete Wood[1]
Recipients of the wind resource tax*** Who receives the financial support?	Citizens' community of St. Gallen (Ortsbürgergemeinde) Electricity cost subsidy for those in need of social assistance St. Gallen Wind Fund****
Amount of the wind resource tax per wind turbine per year How much is the payment made to the recipient of the wind dividend?	500 CHF 20,000 CHF 40,000 CHF
Ownership Structure of the Wind Farm Who owns the wind farm? (Illustrated)	30% owned by the bank, 40% by the Citizens' community, 30% by Axpo 100% owned by the Citizens' community 51% owned by W.E.B. Windenergie AG*****, 30% by the Citizens' community, 10% by the bank, 9% in free float******

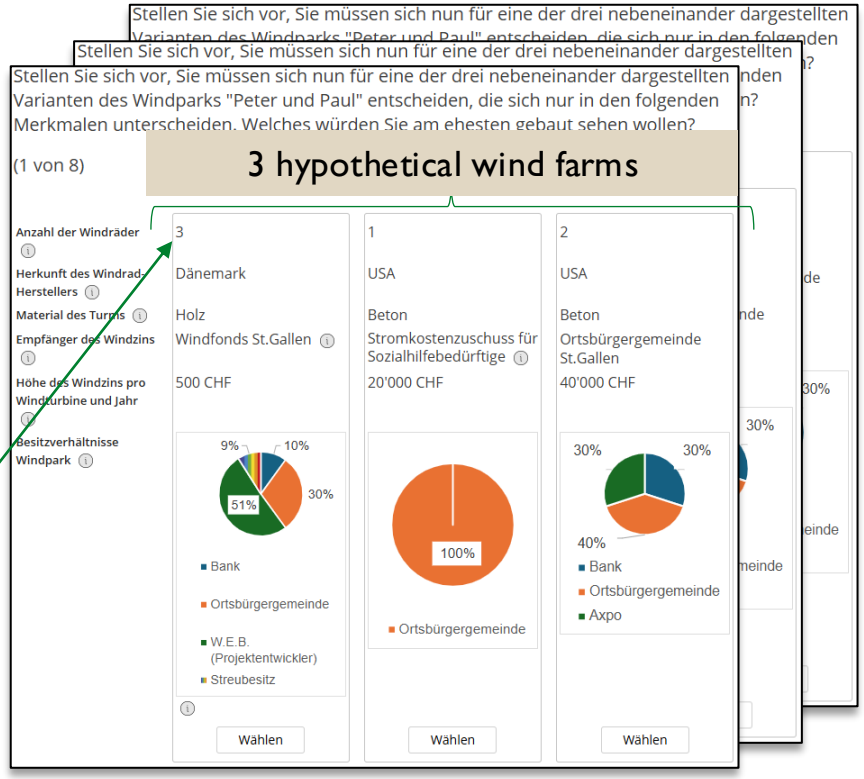
*) A wind turbine produces approximately 6,000 MWh of electricity annually. By way of comparison: A wind farm with 3 wind turbines could cover around 10% of the electricity consumption of households in St. Gallen.**) In reality, the tower of a wind turbine can be constructed from steel, concrete, or wood.
***) The wind royalty is a voluntary payment made by the project developer to the local population in exchange for the use of wind resources and the alteration of the landscape.
****) The St. Gallen Wind Fund would support local projects. Various stakeholders from the region (e.g., sports clubs, neighborhood associations, school classes) can propose such projects, which are then selected through a multi-stage process (public voting, evaluation by a jury).
*****) W.E.B. Windenergie AG is a company specializing in the development and construction of wind farms
******) Free float means that various private individuals hold financial stakes in the wind farm.
1) There are wind turbine producers that use wood as main tower material, such as Modviion (https://modvion.com) or Voodin Blades (https://www.voodin-blades.com)

Methodology of Choice Experiments

8 tasks per respondent, each with randomly varying attribute-levels shown

6 attributes examined for the Petra and Paula wind farm

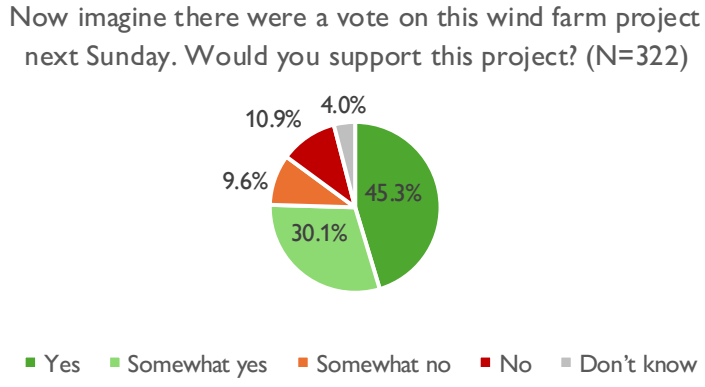
3 different random attribute levels



Opt out option was excluded integrated as then respondents do not compare the specific attributes against each other and valuable data would be lost on what they prefer when having to be integrated in a realistic scenario

A majority of residents in the St. Gallen region would accept the Petra & Paula wind farm

- After reading the text and viewing the image on the right, respondents were asked to indicate whether they would accept the hypothetical wind farm Petra & Paula.
- Result: 75.4% answered “Somewhat Yes” or “Yes”



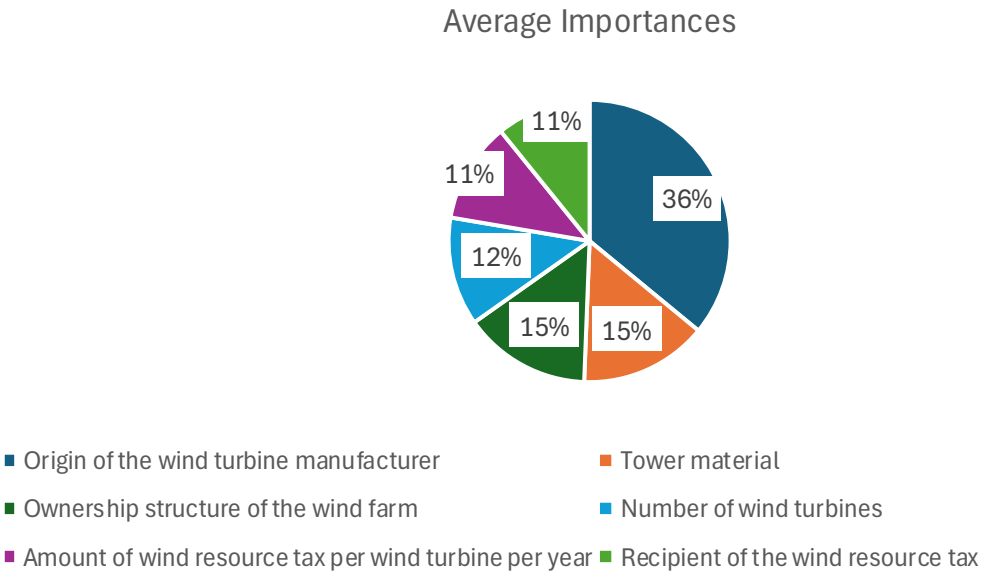
***) The scale in the questionnaire was reversed—the scale has been inverted accordingly

As of the end of 2024, there were 47 wind turbines in operation in Switzerland, collectively covering the annual electricity consumption of approximately 77,000 households*. In Eastern Switzerland, however, there is currently only a single wind turbine in the Chur Rhine Valley. This is set to change in the coming years to meet the energy policy goals of the federal government, cantons, and municipalities**. This is also intended to contribute to security of supply, particularly during the winter months. In addition, wind power generation reduces dependence on energy imports and supports the achievement of climate goals. Currently, only one-third of the electricity demand in the canton of St. Gallen is covered by domestic sources.

Now, please imagine that the “Petra and Paula” wind farm is being planned on the outskirts of the city of St. Gallen. The site is located in the Rotmonten neighborhood on land owned by the citizens' community of St. Gallen. Suppose the construction of one to three wind turbines is planned, following the completion of the necessary environmental impact assessments and wind measurements that indicate economically viable electricity production. You have seen the image below before. It illustrates this hypothetical project.

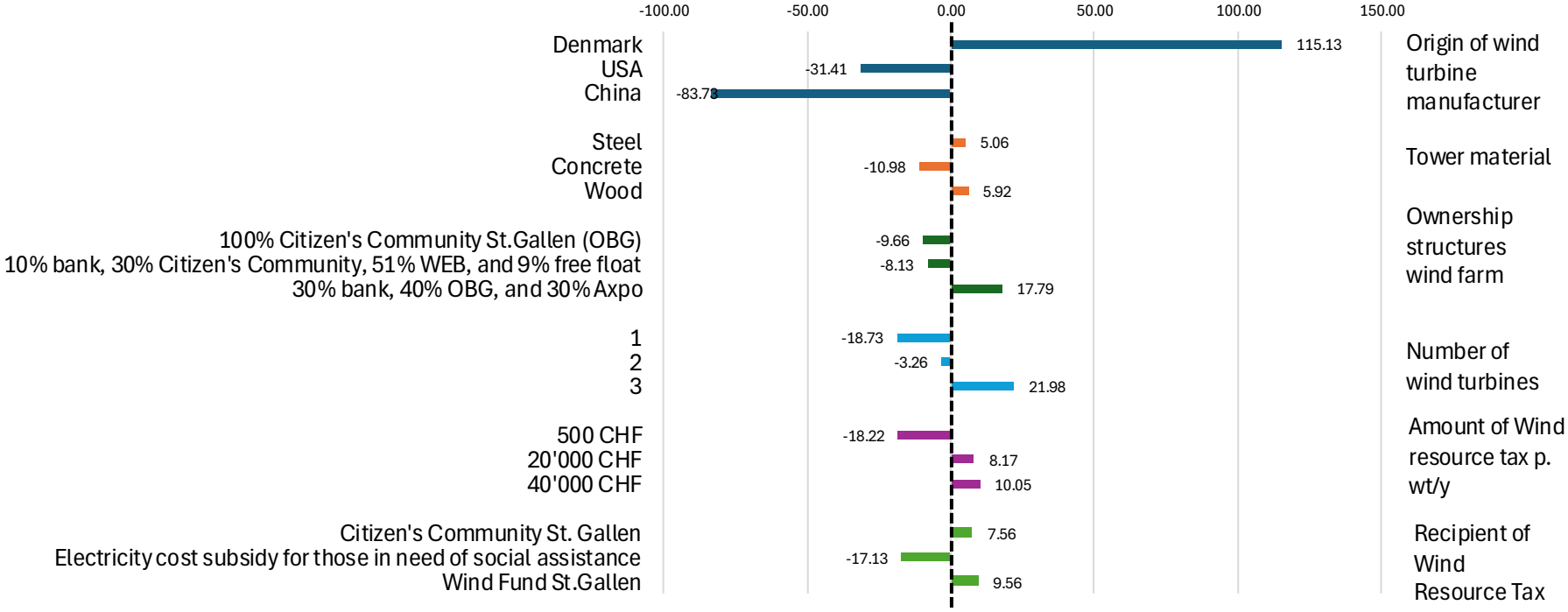
*)Calculation based on household electricity consumption of 2,190 kWh/year for a two-person household in an apartment building (excluding space heating and hot water). Source: EnergieSchweiz – Actual consumption depends on individual lifestyle and electrical appliances. You can see your own electricity consumption on your electricity bill.
**)For more information, see the Energy 2030 website of the Canton of St. Gallen

The Origin of the Wind Turbine is more important than the Wind Resource Tax indicating a "Europe First" tendency



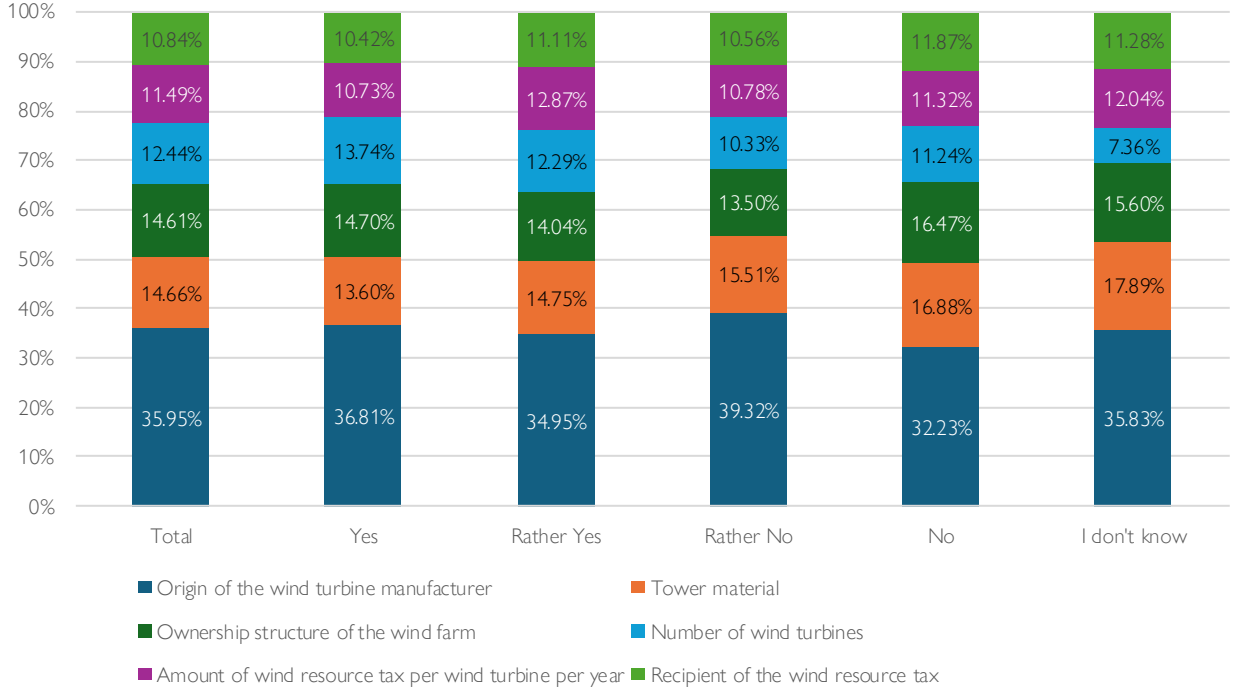
The origin of the wind turbine manufacturer is the most important factor, followed by the material of the tower and the ownership structure of the wind farm – financial compensation for residents ("wind resource tax") has a positive but comparatively smaller impact on acceptance.

Part-worth utilities of wind farm attribute levels



Respondents strongly favored wind turbines from Denmark, whereas turbines from the US or China decreased project appeal. For tower material, steel and wood outperformed concrete in terms of likelihood to choose the wind farm.

Segmentation analysis of importances grouped by Local Acceptance

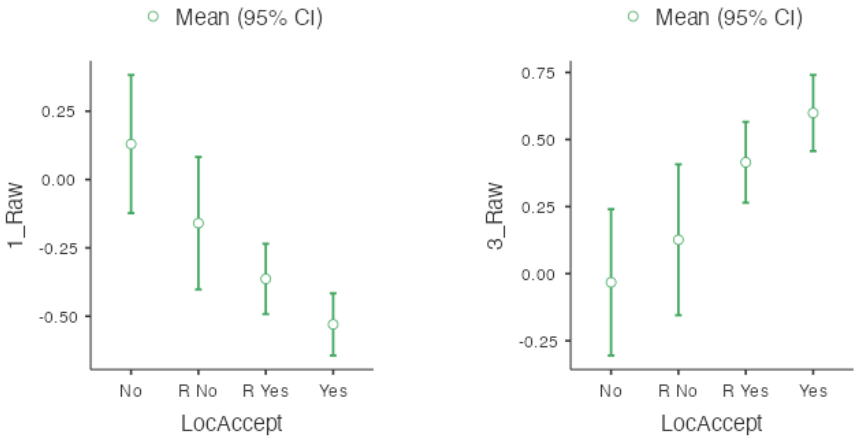


One-Way ANOVA (Welch's) test shows no statistically significant differences in importances between different acceptance levels

Segmentation analysis of individual utilities grouped by Local Acceptance shows significant differences in 1 vs. 3 wind turbines

One-Way ANOVA (Welch's)

	F	df1	df2	p
1_Raw	8.871	3	87.375	<.001
2_Raw	1.196	3	95.358	0.315
3_Raw	7.232	3	89.413	<.001
Dänemark_Raw	1.508	3	87.164	0.218
USA_Raw	0.159	3	90.432	0.924
China_Raw	2.687	3	90.443	0.051
Stahl_Raw	0.933	3	85.897	0.428
Beton_Raw	2.062	3	87.345	0.111
Holz_Raw	1.627	3	84.719	0.189
Ortsbürgergemeinde St.Gallen_Raw	1.243	3	88.616	0.299
Stromkostenzuschuss für Sozialhilfebedürftige_Raw	1.414	3	86.164	0.244
Windfonds St.Gallen_Raw	0.888	3	86.807	0.451
500 CHF_Raw	0.345	3	89.518	0.793
20'000 CHF_Raw	0.440	3	87.538	0.725
40'000 CHF_Raw	0.170	3	92.039	0.917
100% Ortsbürgergemeinde_Raw	1.139	3	89.745	0.338
10% Bank, 30% Ortsbürgergemeinde, 51% WEB und 9% Streubesitz_Raw	0.817	3	86.707	0.488
30% Bank, 40% Ortsbürgergemeinde und 30% Axpo_Raw	0.415	3	88.686	0.743



While respondents who supported the hypothetical wind farm clearly preferred three wind turbines, opponents clearly and statistically significantly viewed this option as the least preferred one; the same was true for a single wind turbine, though in reverse: this option was the least preferred by supporters, but was actually preferred by opponents.

Policy Implications

Results	Policy Implications
1. Manufacturer Origin = Most important attribute for community acceptance in this study → Preference for "Made in Europe" might be linked to: Geopolitical tensions, supply chain reliability	 • Relevant for future procurement, non-price criteria in CH, reinforcing the EU Net-Zero Industry Act (NZIA)'s plan to switch from "price only" to "best value for money" auctions including qualitative criteria • Focus more on ethnocentric arguments - e.g., German Car = VW; Danish Wind Turbine = Vestas
2. Tower Material with steel and wood perceived as better than concrete, might be due to the perception of wood as a more sustainable or less visually intrusive material?	 • More R&D funding in new, innovative towers that are visually less intrusive • Policymakers could ask for integration in the project description and communication strategies for project developers
3. Wind Resource Tax = important but secondary when other attributes are considered	 • Integration into project planning, but recommend project developers to use financial participation as part of a broader citizen integration strategy

Sources: Portela de Carvalho (2025); WindEurope (2022), European Parliament & European Council (2024)

Conclusion

- **High regional acceptance in the study area (N=322):** 75.4% would (somewhat) approve of a *Petra & Paula* wind farm.
- **Key acceptance factors:**
  - Origin of the turbines (*"Made in Europe"*)
  - Tower material (wood/steel > concrete)
  - Locally diversified ownership structure between the bank (30%), the Citizens' commune (40%), and Axpo (30%)
  - Wind resource tax works, but have a comparatively smaller influence
- Segmentation analysis of individual level utilities shows that only differences between voters group lie in the **quantity of wind turbines installed**

Acknowledgments
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Martina Schwizer
Research Associate &
Doctoral Candidate
martina.schwizer@unisg.ch

University of St.Gallen
Institute of Responsible Innovation, Sustainability and Energy (RISE-HSG)
Müller-Friedbergstrasse 6/8
9000 St.Gallen

rise.unisg.ch

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