ONLINE-APPENDIX

to

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Glossary

Actor constellation(s)	Actor constellations refer to an analytical category of actor-centered institutionalism (ACI). In the present study, I have proposed that actor constellations be measured with a "mapping" of the relative positions and relations between actors. Empirically, the study has measured the concept as the number of organizations, the number of veto players, reputational power, discretionary power, the existence and intensity of agreement and conflict or the existence and intensity of trust and mistrust.
Actor orientations	Actor orientations refer to an analytical category of actor-centered institutionalism. Orientations mean the preferences of an actor on a selected topic. Orientations were measured for each stakeholder taking part in an implementation arrangement in a Swiss WE-authorization procedure. There are ten individual statements, on which stakeholders were asked to indicate their preferences. The first four are elements of "core orientations" and the latter six are "secondary orientation" elements. Core items ask about deeper worldviews on the issue of WE in Switzerland, secondary items ask about orientations towards particularities of WE-projects (see section 5.6.2. for details). Respondents are asked to to agree or disagree with the statements, on a scale of 2 (full agreement) to -2 (full disagreement). An explo-

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	ratory factor analysis is used to elicit three factors from these ten items: A full factor, incorporating all ten items, a core-factor using the first four and a secondary-factor using the latter six.
Actor-centered institutionalism	Actor-centered institutionalism is the theoretical framework that this study has applied. It has been elaborated by Scharpf and Mayntz since the 1970's and has been formalized in their 1995 publication. Its function is to pre-define a researcher's perspective on those aspects of social reality that are particularly important for value production in administrative settings: I refer to these important aspects as "analytical categories". These are: actors and their orientations and capabilities, actor constellations and modes of interaction. The analytical framework is defined in detail in chapter 2.
Authority	In the present study, authority denotes a governmental actor's capacity for action based on autonomous and/or shared legal competences. An actor must have action resources as a condition for authority.
Autonomy	Autonomy refers to the autonomous sources of authority. In this sense and in this study, following Riker (1975, 101), autonomy denotes the range of decisions that a governmental actor can take in final instance by itself. Like authority, autonomy also presupposes the existence of action resources.
Average	The average refers to the arithmetic mean unless noted otherwise.

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Betweenness centrality	Betweenness centrality measures the importance of a node as a connector between all other nodes in a network. $\sum_i^n \frac{shortest\ path_{s\rightarrow t through\ i}}{total\ no\ of\ shortest\ paths_{s\rightarrow t}}$, where the path measures the number of edges from one node to another. "s" and "t" are two specific example nodes in a network comprising "i" to "n"-nodes.
Coalition scores	There are two types of coalition scores, one that simply measures actor orientations (1), and another one that relies reputational power and with actor orientations (2). A coalition refers to those organizations that are involved in a wind energy-implementation arrangement and have orientation scores of >0 (proponent coalition) and <0 (opponent coalition member). (1) Mean actor orientations of the proponent (opponent) coalition thus refer to the mean orientation scores of all proponents (opponents). (2) Coalition scores also result from the measure of reputational power applied to proponent and opponent actor orientations: The reputational power scores of proponent (opponent) organizations in a wind energy-project are meaned, resulting in the indicator of the mean reputational power of the proponent (opponent) coalition. Reputational power scores were derived from the most reliable reputational power measure, the "full category" measure, see section 5.6.2, subheading "actor constellation metrics". For both types of coalition (power) scores (1) and (2), the difference between mean proponent and mean opponent scores was further calculated. This indicates polarization of orientations in

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	the first measure, or the size of power differences between coalitions in the second measure.
Collective actor	In the present study, collective actors refer to composite actors that have a lower level of integration than corporate actors, meaning they are "[...] dependent on and guided by the [private] preferences of their members" (Scharpf 1997, 54). Possible forms are a "movement", a "club", a "coalition" or an "association" (ibid., 55ff.).
Composite actor	This higher level term of composite actors contains both the collective and the corporate actor types.
Corporate actor	A type of composite actor that has a "[...] high degree of autonomy from the ultimate beneficiaries of [its] action and whose activities are carried out by staff members whose own private preferences are supposed to be neutralized by employment contracts" (ibid., 54). Corporate actors are guided by the preferences of the corporate actor, not the private preferences of its constituents, and there tends to be some degree of hierarchical direction. An example would be a joint-stock company.
Decentralization	The present study uses two understandings of decentralization, depending on the level of analysis: For within country comparisons, decentralization denotes the balance between the relative powers of sub-subnational vis-à-vis subnational governments. Concretely, the powers of sub-subnational governments are composed of autonomous sub-subnational (self-rule) powers, as well as of sub-subnational po-

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	wers at the central subnational level (called "interactive rule", see Ladner et al. 2015). In contrast, for comparisons between countries, decentralization refers to autonomous competences of the subnational governments (self-rule) only, under the exclusion of shared rule competences at the central national level.
Degree	The degree of a node denotes the absolute number of connections it has to other nodes in the network. In a so-called "complete" network, each actor has a tie with each other actor. Importantly, the degree does not measure the relative number of all possible binary ties but represents an absolute measure of either the number of ties in an arrangement or the ties of a node.
Density	Density denotes the connectedness of a network: It is the ratio of observed edges as a fraction of the number of possible edges (Frey 2018). $D(g) = \frac{\text{No. of observed edges in the network}}{\text{No. of possible edges in the network}}$.
Deployment	In the context of renewable energy, deployment denotes the added capacity or energy of installations to produce renewable energy. It also refers to the growth of capacity or energy of such installations over time. A synonym is expansion.
Developer	Developers are those private or public actors that propose and plan a wind energy-project. Vis-à-vis the public authorities, they are the applicants for a change in a local land-use plan (LLUP) or a construction permit.

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Edge	An edge denotes a tie (*syn.* relation) between two nodes (*syn.* vertice) in a network.
Energy	When referring to energy, the present study does not contain discussions on any other forms of energy than electricity as secondary energy (UN ECOSOC 2017). Energy is also the unit of consumption and production of electricity, and it is referred to in kWh, MWh, GWh or TWh.
Federalism	As an understanding of federalism, this study follows the classic definition by Elazar (1987) that understands federalism as self-rule and shared rule. Self-rule indicates the extent of autonomous powers of a government. Here, shared rule is restricted to denoting the subnational governments' co-decision powers at the national center.
Implementation arrangement	In this study, an implementation arrangement denotes the set of organizations (stakeholders) that implement a wind energy-authorization procedure together. These arrangements do not contain the institutional context, in which they are embedded.
Installed capacity	Installed capacity refers to a rating of the power station. It indicates what could maximally be produced, if the power station were running at 100% load. For example, an installed capacity of a wind turbine of 3 MW means that in perfect wind conditions for 1 hour, the turbine can produce 3 MWh of energy.
Institution	An institution is referred to as a defined, practiced, and sanctioned rule that is stable across some time. The present study concurs with institutional scholars to understand "rule" on a macro-level, as the

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	”polity” or the “form” of politics (Sager et al. 2017) or the organizational frame for political action (Bernauer et al. 2018). Still, concurring with policy scholars, institutions are understood as a contextual factors with a function, instead of treating them as ends by themselves as classical institutionalist would. Non-constitutional “lower-level” rules are simply referred to as “policy-rules”.
Intensity	Intensity denotes the “strength” or “closeness” of a relationship in an organizational network (in an implementation arrangement). There were three measures of intensity in this study: Collaboration, agreement-conflict and trust-mistrust. For collaboration, the scale varies ordinally from 0–3, with “0” being the absence of a collaborative relation and “3” being a frequent collaboration. For the intensities of agreement-conflict and trust-mistrust, I have applied a scale from “2” (strong agreement, trust) to “-2” (strong conflict, mistrust), with “0” counting as the absence of relation.
Isolate	An isolate is a node (an organization/stakeholder in a network) that is unconnected to any other node in the network. It has a degree of zero.
Mode of interaction	Modes of interaction refer to an analytical category of actor-centered institutionalism. In the present study, the modes of interaction are measured by how strongly an actor is embedded in terms of collaboration/coordination within the other actors. Empirically, it has been measured as the formality of coordination, the prevalence of negotiation versus the use of hierarchi-

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	cal direction, number and density of collaborative relations as well as their intensity, number of access points for external interest organizations and as betweenness centrality in collaboration.
Negative coordination	Negative coordination represents a minimal form of (non-) coordination, where actors only respect the others' protected interests, but do not go into "problem-solving mode". This can solely lead to pareto-superior solutions (Scharpf 1997, 1993), as actors protect what they have. This has also been known as "deferential adjustment" (Lindblom 1965). Typically, this happens in bilateral meetings and has low transaction costs.
Network	In Social Network Analysis (SNA), networks consist of nodes (organizations, *syn.* vertices) and edges (relations, *syn.* ties). Generally, in this study, when speaking of a network, the implementation arrangement is meant, unless specified otherwise.
Network routine	A network routine refers to a defined metric of the social network analysis toolbox of statistical "routines" (e.g. by Wasserman and Faust 1994). In the literature, they are also known as basic graph theory measures.
Node	Node is a network term that is used synonymously with "vertice".
Organization	A composite actor with the capacity of strategic action, defined membership criteria, decision-making principles and internal distribution of tasks and responsibilities. In the present study, it is the only type of composite actor that is focused on.

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Performance	Performance denotes any measurement of "value, merit and worth of things" (Scriven 1991). In the present context, it fully overlaps with a colloquial meaning of "how well" a problem has been solved. Problem-solving effectiveness (PSE), the performance-concept of the present study, is only one possible conceptualization of this broad understanding of performance.
Policy-field	A policy-field refers to the set of legal rules in force by all levels of government that regulate a certain topic or technology. In the case of wind energy, the policy-field contains all legal rules that govern how the public deals with wind energy. This includes all legal rules, such as subsidies, or rules that design the authorization procedure of wind turbines.
Policy-sector	See "policy-field".
Positive coordination	Positive coordination represents a maximal form of collaboration/coordination, where actors deeply collaborate extensively with all others. This opens up the finding of solutions in a larger welfare space, the Kaldorian space (Kaldor 1939), compared to the set of pareto-optimal solutions that can maximally be reached in negative coordination. Following Scharpf (1997), the Kaldorian welfare space allows for losers of a solution to be compensated. Such coordination may happen in multilateral meetings and it has enormously high transaction costs.
Power(s)	In the present study "power" can have two meanings, depending on the context: The first meaning refers to (legal) competences attributed to a level of government or an agency charged with implementati-

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	on. This is treated as if it were countable. The second denotes reputational power, meaning the amount of importance in a WE-implementation that a stakeholder has been attributed by others. How the indices of reputational power are constructed is explained in section 5.6.2., subheading "actor constellation metrics".
Problem-solving effectiveness	In the present study, the term denotes "how well" an implementation problem has been solved by an implementation arrangement. More precisely, it assesses the production of value in the process of problem-solving. In the present study, I have proposed three concrete measures to assess PSE, following Knoepfel et al.'s (2015) concepts of effectiveness: The first captures "effectivity", denoting the measurement of the distance between an intervention and the goal. Here, the intervention has been whether to pursue the planning of a WE-project, or how this has been done concretely. Concretely, to measure effectivity, the study has modeled the probability of cantons and municipalities to host a WE-project and has assessed which factors make wind energy-hosters more probable hosts, where being a host in a suitable area is considered to be a goal of the ES 2050. Two other indicators measure the distance between outcomes (based on throughput or output) and the goal, measuring "efficacy". As the first efficacy-measure, the study has proposed to measure the efficiency of wind energy-authorization procedures as its duration in months. It relates the duration to the goal of the ES 2050. As a second measure, the

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	study has asked stakeholders in implementation arrangements to rate an authorization procedure's fairness, competence, transparency, perceived efficiency and satisfaction with regard to their own goals in a wind energy-authorization procedure.
Region	For the Swiss comparative study, a region is a territory situated within the cantons. It is a district that is larger than a municipality, but smaller than a canton. In the European study, a region refers to the subnational level, not the supranational level.
Reputational power	Reputational power is a network-measure indicating who the most important organizations are in a WE-project, as named by the involved organizations. For details about how the measures are constructed, see section 5.6.2, subheading "actor constellation metrics".
Size of network	The size of the network/arrangement refers to the number of organizations involved in a wind energy-implementation arrangement.
Stakeholder	In this study, each organization that is involved in a wind energy-implementation arrangement is referred to as a stakeholder.
Themes	Themes refer to the material content of a tie (*syn.* relation, edge) in a network. There are four different "themes" of a network: General collaboration, (voluntary) collaboration above-legal-minima, agreement-conflict and trust-mistrust.
Tie	See "edge".
Vertice	See "node".
Veto player	The term of veto player refers to those organizations with formal veto powers in

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a WE-implementation arrangement in Switzerland. They include all those that have the power to block a project with the consequence of its cancellation. I treat organizations of the following stakeholder-categories as veto players: municipalities, cantons, developers and opponent NGOs.

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Appendix A

Table A: Interviews by date.

Number	Date
1	14.10.2020
2	21.10.2020
3	23.10.2020*
4	23.10.2020*
5	04.11.2020
6	12.11.2020
7	13.11.2020
8	20.11.2020
9	27.11.2020
10	04.12.2020
11	07.12.2020
12	11.12.2020*
13	11.12.2020*
14	18.12.2020
15	15.01.2021*
16	15.01.2021*
17	29.01.2021
18	02.02.2021
19	25.03.2021
20	01.04.2021

Notes: *Separate interviews on the same day.

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Appendix B

Table B: Data sources overview.

Data	Sources	Ct.	M.
Decentralization			
• Ct. decentralization index	Mueller 2015, 2022	x	
• Local Autonomy Index (LAI)	Ladner and Keuffer 2021 Ladner et al. 2015	x	
• Relative m. expenditure and income	EFV 2021	x	
• M. secretary survey 2017	Ladner et al. 2021		x
Political party data			
• Statistical portraits of ct. and m.	BFS 2019a,b	x	x
• Patterns of democracy in the Swiss ct. dataset	Vatter et al. 2020	x	
• Left ct. executive presiding over constr. dept.	Self-collected	x	
Municipal capacities			
• M. secretary survey 2017	Ladner et al. 2021		x
Sectoral and procedural policy-rules			
• PCS survey 2020/21	Self-collected	x	x
• NCS survey 2020/21	Self-collected		
• Ct. structure plan competence distribution	Self-collected	x	
• M. secretary survey 2017	Ladner et al. 2021		x
Geographic, demographic and cultural conditions			
• Selected geo-, demographic and language data	BFS 2019a,b BFS 2021a BFS 2021b	x	x
• Municipal typology (2012)	BFS 2012		x

Notes: "Ct." is short for canton, "M." for municipality, "constr. dept." for construction department. An "x" indicates for which level of comparison the data are used.

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Appendix C

Table C: Exploratory factor analysis models for actor orientation factors.

Statements	**Full**	**Core**	**Secondary**
The balance of interests is normally conducted in a fair, open, transparent and efficient manner.	0.568	0.877	
The wind energy authorization procedure is as efficient as possible.	-0.001	0.415	
Wind energy can contribute to combating climate change.	0.865	0.574	
The environmental impact assessment is a suitable instrument to address environmental impacts.	0.429	0.517	
The feed-in-tariff is an efficient use of public money.	0.748		-0.755
A wind turbine can be completely dismantled and without long-term consequences for the environment.	0.836		-0.835
Despite all turbine components stemming from foreign countries, wind parcs promote the local economy.	0.889		-0.864
Wind parcs lead to the disfigurement of a landscape that conveys personal identity.	-0.853		0.841
Even when obligations from the environmental impact assessment are fulfilled, wind turbines have negative consequences for human health.	-0.750		0.774
The environmental impact assessment incorporates the protection of flora and fauna only insufficiently.	-0.904		0.926
Eigenvalue	5.406	4.206	4.171
χ^2	89.921	7.302	14.206
χ^2 p-value	0.000	0.026	0.115
RMSEA	0.129	0.167	0.078

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Appendix D

Table D: Overview over Mueller's (2015) index of cantonal decentralization.

Dimension	**Component**	**Coding/ theoretic range**	**Min.**	**Max.**	**Mean**	**SD**
Cantonal dec.		Z-scores	-1.64	1.35	0	1
Polity		Z-scores	-1.84	1.4	0	1
	Giacometti-index	Ord., 0–2	0	2	1.23	0.75
	Perceived local autonomy (2017)	Ord., 1–10	1	10	4.59	1.77
Policy		Percent[3]	48.64	161'809.89	83'290.1	42'687.93
	Fiscal dec.	Mean of %	2.2	47.16	34.66	9.51
	Personnel dec.	Mean of %	4.2	59.96	43.09	14.06
	Administrative dec.	Percent	5.26	63.99	49.39	12.32
Politics		Z-scores	-1.14	1.34	0	1
	Electoral dec.	Mean of ord., 0–4	0.625	3	1.88	0.64
	Representational dec.	Mean of %	0	52.5	11.27	12.61
	Directdemocratic dec.	Ord., 0–4	0	4	1.27	1.68

Notes: "Dec." is shorthand for "decentralization". All data sources are indicated in table tab: overview over data sources used for institutional, non-institutional and partisan comparison in the online-appendix.

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Appendix E

Table E: Tested policy-rules.

Policy-rule	**Respondent(s)**
Procedural policy-rules	
Project blocking through CSP elaboration	Developers
Number of planning phases after CSP	Developers/cantons
Regional plan basis necessary	Cantons
Intermittent and developer-planned adjournment of project	Developers
Extent of private-persons complaints	Developers
Extent of associational complaints	Developers
Extent of municipal involvement as stakeholder	Municipalities
Extent of municipal benefits	Municipalities/ developers
Municipal assessment effort of project	Municipalities
Number of conditional stipulations (by topic area) in LLUP-approval report	Cantons
Number of conditional stipulations (by topic area) in construction permit	Cantons/ municipalities
Number of possible legal cascades	Cantons
Dossier circulation index (parallel/sequential, established/free-flowing)	Cantons
Federal assessment effort of project	Federal agencies
Sectoral policy-rules	
Parliament or cantonal executive adopts the CSP	Secondary (self-collected)
Municipal overstraining regarding the issuing of construction permits	MSS* (2017)

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Policy-rule	**Respondent(s)**
Municipal overstraining regarding spatial planning	MSS* (2017)
Municipal overstraining regarding landscape and built heritage protection	MSS* (2017)
Municipal overstraining regarding environmental protection	MSS* (2017)
Municipal overstraining regarding energy supply	MSS* (2017)
Significance/affectedness of municipality by energy politics/policy	MSS* (2017)
Significance/affectedness of municipality by construction politics/policy	MSS* (2017)
Significance/affectedness of municipality of ES 2050	MSS* (2017)

Notes: *"MSS (2017)" stands for "municipal secretary survey of 2017", as collected by Ladner and his team (2021).

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