Hands off the alps?

Choice Experiment on Peoples preferences on Landscape developments through New Renewable Energy Infrastructures (nREI) in Swiss Alpine Landscapes.

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Method (Choice experiment)

- Swiss wide representative online panel survey (n=844).
- 224 possible Scenarios.

Attribute	1_PLAT_URB	2_PLAT_AGRI	3_JURA	4_PRE_ALPS
LANDSCAPE				
	5_ALP_URB	6_ALP_TOUR	7_ALP	
				

Attribute	Level 1	Level 2	Level 3	Level 4
WIND	NO	MIN	MED	MAX
PHOTOVOLATIC	NO	MIN	MED	MAX
POWERLINES	NO	YES	-	-

Results: General Preference of respondents

Attributes	Avg. Utilities	t-Values	p-Values
1_PLAT_URB	29.114	17.352	***p < 0.01
2_PLAT_AGRI	17.904	11.471	***p < 0.01
3_JURA	-2.284	-1.481	n.sign. (p < 0.15)
4_PRE_ALPS	-13.248	-8.135	***p < 0.01
5_ALP_URB	7.656	4.176	***p < 0.01
6_ALP_TOUR	5.827	2.772	***p < 0.01
7_ALP	-44.970	-31.764	***p < 0.01
WIND NO	35.984	28.565	***p < 0.01
WIND MIN	20.004	18.960	***p < 0.01
WIND MED	-23.059	-23.811	***p < 0.01
WIND MAX	-32.930	-23.630	***p < 0.01
PV NO	-6.444	-5.174	***p < 0.01
PV MIN	27.573	28.088	***p < 0.01
PV MED	12.393	12.577	***p < 0.01
PV MAX	-33.522	-29.290	***p < 0.01
PL NO	17.957	21.735	***p < 0.01
PL YES	-17.957	-21.735	***p < 0.01
NONE	-105.231	-40.787	***p < 0.01

Attributes	Avg. Importances	t-Values	p-Values
Landscape	37.759	97.682	***p < 0.01
Wind	26.348	68.681	***p < 0.01
Photovoltaic	23.625	79.113	***p < 0.01
Powerines	12.268	41.419	***p < 0.01

- **Landscapes:**
- PLAT_URB most preferred.
- ALP least preferred.

- **Wind**: linear decrease from Wind_NO.
- Weak decrease from _MED to _MAX.

- **PV**: PV_NO Scenarios less preferred than _MIN or _MED Scenarios.

- **PL**: general low preference.

- **Landscape most important attribute** related to the choice decision.

Results: Scenario oriented simulation of preferences

Scen	Wind	PV	PL	1 PLAT_URB	2 PLAT_AGRI	3 JURA	4 PRE_ALPS	5 ALP_URB	6 ALP_TOUR	7 ALP	Total per Scen.
1	-	-	-	1.1	0.9	0.6	0.6	0.9	1.0	0.3	5.3
2	-	-	YES	0.7	0.6	0.4	0.3	0.6	0.5	0.2	3.2
3	-	MIN	-	1.6	1.4	0.9	1.1	1.3	2.5	0.7	9.5
4	-	MIN	YES	1.0	0.8	0.5	0.6	0.8	1.2	0.3	5.2
5	-	MED	-	1.3	1.2	0.8	0.9	1.1	1.5	0.5	7.4
6	-	MED	YES	0.9	0.7	0.5	0.5	0.8	0.8	0.3	4.5
7	-	MAX	-	0.6	0.5	0.4	0.5	0.4	0.8	0.2	3.4
8	-	MAX	YES	0.4	0.3	0.2	0.2	0.3	0.4	0.1	2.0
9	MIN	-	-	1.0	0.8	0.6	0.4	0.7	0.7	0.2	4.3
10	MIN	-	YES	0.7	0.5	0.3	0.2	0.5	0.3	0.1	2.7
11	MIN	MIN	-	1.4	1.2	0.8	0.7	1.1	1.5	0.4	7.2
12	MIN	MIN	YES	0.9	0.7	0.5	0.4	0.7	0.7	0.2	4.0
13	MIN	MED	-	1.1	1.0	0.7	0.5	0.9	0.9	0.3	5.4
14	MIN	MED	YES	0.8	0.6	0.4	0.3	0.6	0.5	0.1	3.4
15	MIN	MAX	-	0.4	0.4	0.3	0.2	0.3	0.4	0.1	2.2
16	MIN	MAX	YES	0.3	0.3	0.2	0.1	0.2	0.2	0.1	1.4
17	MED	-	-	0.4	0.4	0.2	0.2	0.3	0.3	0.1	1.9
18	MED	-	YES	0.3	0.2	0.1	0.1	0.2	0.1	0.0	1.1
19	MED	MIN	-	0.7	0.6	0.4	0.4	0.5	0.9	0.2	3.5
20	MED	MIN	YES	0.4	0.3	0.2	0.2	0.3	0.4	0.1	1.8
21	MED	MED	-	0.5	0.4	0.3	0.3	0.4	0.5	0.1	2.5
22	MED	MED	YES	0.3	0.3	0.2	0.2	0.2	0.2	0.1	1.4
23	MED	MAX	-	0.2	0.2	0.1	0.1	0.1	0.3	0.1	1.2
24	MED	MAX	YES	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.7
25	MAX	-	-	0.5	0.4	0.2	0.1	0.3	0.3	0.1	1.9
26	MAX	-	YES	0.4	0.2	0.1	0.1	0.2	0.1	0.0	1.2
27	MAX	MIN	-	0.8	0.6	0.4	0.3	0.5	0.7	0.1	3.3
28	MAX	MIN	YES	0.5	0.3	0.2	0.2	0.3	0.3	0.0	1.9
29	MAX	MED	-	0.6	0.4	0.3	0.2	0.4	0.4	0.1	2.3
30	MAX	MED	YES	0.4	0.3	0.2	0.1	0.3	0.2	0.0	1.5
31	MAX	MAX	-	0.2	0.2	0.1	0.1	0.2	0.2	0.0	1.1
32	MAX	MAX	YES	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.7
		Total per LS		20.8	16.9	11.4	10.3	15.7	19.0	5.0	

uneven distribution of preferences in landscapes.

\+ Urbanized areas

\+ areas with already existing infrastructures

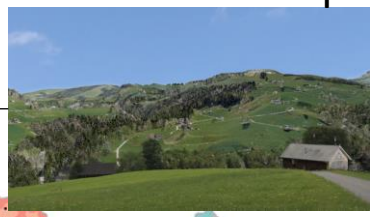
mean: 0.444
median: 0.343
avg. Std.Err.: 0.023

1 Plat-Urb

2 Plat-Agri

3 Jura

4 Pre-Alps



7 Alp

5 Alp-Urb

6 Alp-Tour

N

0 25 50 km

strong

weak

Preferences

Average peoples preferences

Conclusions

1. **Preference tributes to landscape** characteristics **and their** infrastructural **pre-development** *(technisch infrastrukturelle Vorbelastung der Landschaft).*
2. Agricultural landscapes on the Plateau, Jura and Pre-alpine landscapes **are not preferred** for energy developments
   (1) Energy developments are perceived less positive than in already "*polluted*" landscapes (see 1.)
   (2) Developments with Wind and PV are perceived *more positive in lowland areas than in other landscapes*.
3. **Combination** of energy infrastructures show potentials **for a stronger preference**
   1. Combination of Wind and PV infrastructures are evaluated more positive than developments with solely wind energy infrastructures.
   2. Combinations of powerlines with PV infrastructures are evaluated better or similar (at least not worst) than solely powerlines.

Conclusions

4. Roof and façade mounted PV infrastructures

   (1) Landscapes with PV infrastructures **are preferred** against landscapes without PV infrastructures. **Absence** of **PV is perceived negative**.

   (2) BUT only for a small and medium amount of infrastructures (there is also a "too much")

5. Evaluation of Open Space PV: **people generally prefer their absence**. However, small number of infrastructures show indifferent preference (slightly minus sign).

So should we try to keep the Alps energy infrastructure free?

(1) **Yes**, if we try to conquer the "abandoned" alps with technical infrastructures. People don't like that at all. *(in no scenario this landscape is preferred over a single other one)*

(2) **No**, if we focus on landscapes that are already driven by other technical infrastructures (e.g. alpine touristic landscapes). Here people do prefer developments, but with a limitation in the number of infrastructures (min, med)

Thank you!

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